TECHNICAL TRAINING PROGRAM

D014/D015

B132/B200

PRE-TRAINING MANUAL

RICOH GROUP COMPANIES

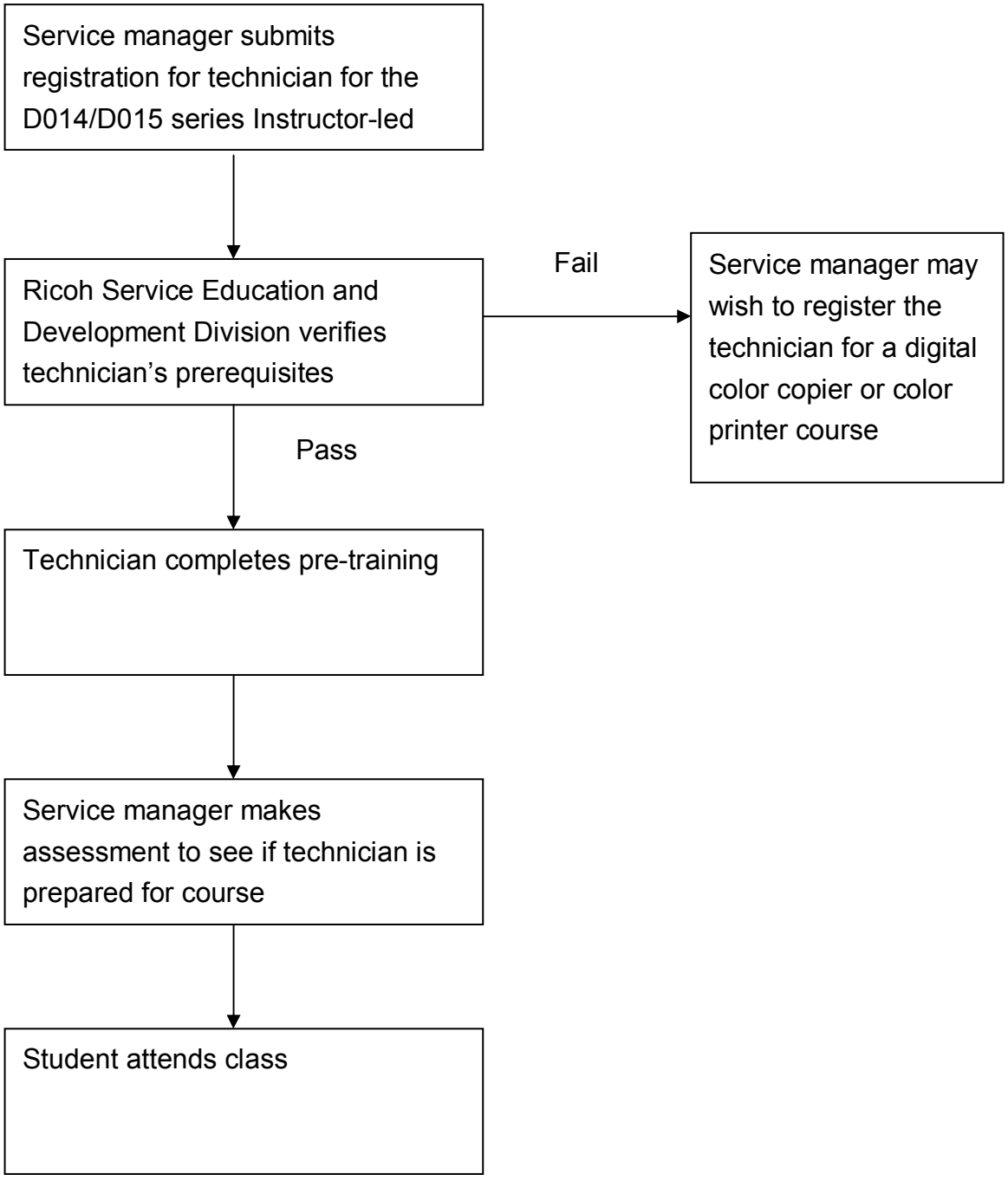
INTRODUCTION

This pre-training manual has been designed to give the service technician an overview of the basic features of the D014/D015 and B132/B200 color copiers/MFPs. It should be kept by the service manager and given to the technician before the technician attends the instructor-led product training.

This manual is only intended for use with the D014/D015 series course and should not be given to technicians attending other training courses.

Should you have any questions, please do not hesitate to contact our Service Education and Development Department at 973-882-2200.

FLOW CHART FOR PRE-TRAINING



Differences Between The D014/D015
&
B132/B200 Service Manuals.

Detailed information, such as some replacement and adjustment procedures, and detailed descriptions have been omitted from this service manual. This is because the information is identical to the previous model B132/B200.

Please refer to the B132/B200 Service Manual for those procedures and descriptions omitted from this manual.

NEW FEATURES OF D014/D015

Responses to Requests for Improvement

This section describes changes that were implemented in response to requests for improvement in the performance of the B132/B200.

Improved Productivity

Copy Speed

Mode	B132/B200	D014/D015
K	B132/B200: 60 cpm	D014: 60 cpm D015: 75 cpm
FC	B132/B181: 45 cpm	D014: 55 cpm
	B200: 55 cpm	D015: 70 cpm

Copying speed has been improved due to:

1. PxP toner with a lower melting point.
2. Better fusing control. This was achieved with a more efficient ac power supply to the fusing unit.

Shorter Warm-up Time

B132/B200	D014/D015
300 sec.	D014 NA: 90 sec. D014/D015 EU: 75 sec. D015 NA: 75 sec.

The shorter warm-up time was achieved by:

- Adopting a sponge hot roller for fusing; the nip is wider, so the fusing temperature is lower
- Adopting an extremely thin heating roller used at lower temperature

Overall System

The system timing has been overhauled based on the B132/B200 base control modules.

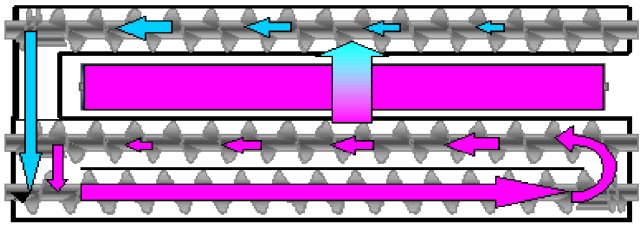
Improved Reliability

Longer Service Life of Developer

Servicing has been improved by extending the service life of the developer. This was achieved by adopting a pre-mixing developer system. Toner and carrier are pre-mixed in the STC (Soft Toner Cartridge with 90 wt% toner, 10 wt% carrier). The toner and carrier are supplied together to refresh the developer already in the development units. High image quality can be maintained for a greater length of time with this system.

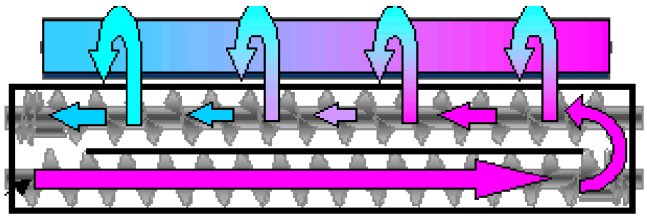
Better Stability of Image Density

Compared to the B132/B200, the consistency of the image coverage has been dramatically increased. This was accomplished by the adoption of the single-direction development system.



D014/D015

ho-196c



B132/B200

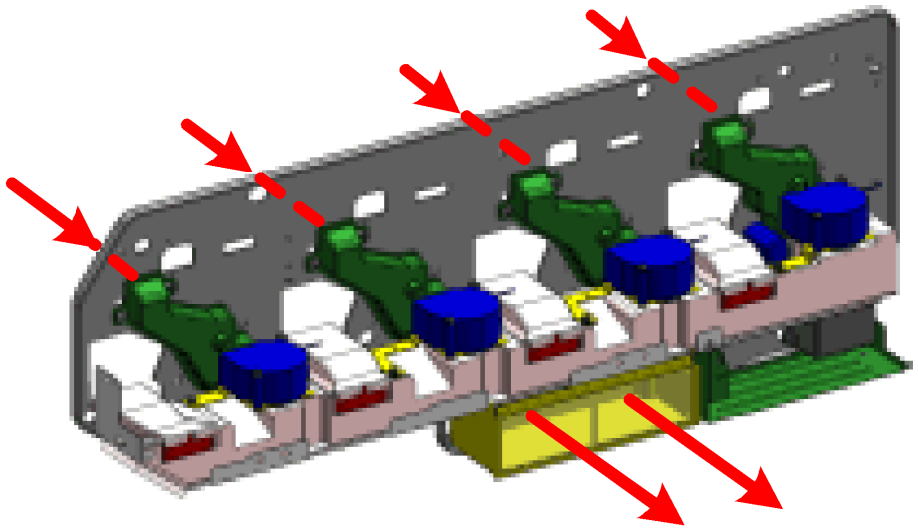
ho-196f
2ho-dev4

- The developer in the D014/D015 development unit is circulated in one direction. This achieves better uniformity in the application of the toner to the developer sleeve.
- Compared to the B132/B200, this means less variation in image density from left to right and from top to bottom on the output pages.

Ventilation: More Effective Cooling

The adoption of the PxP toner with its lower melting point means that the machine must be adequately ventilated to keep the interior of the machine cooler.

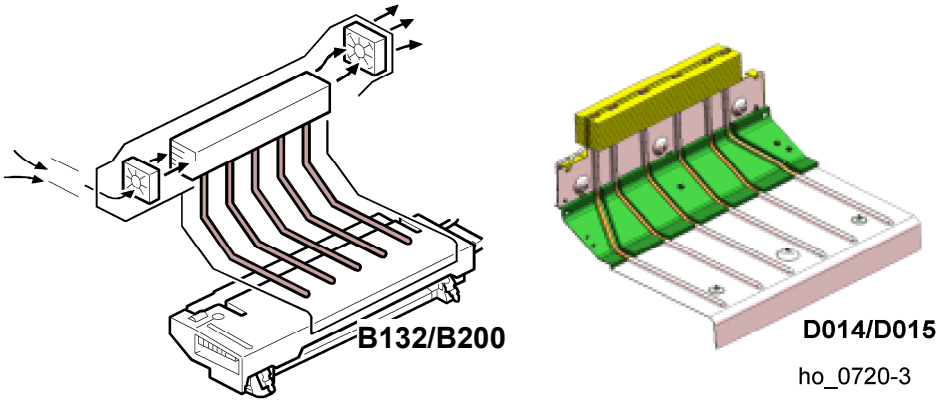
1. Development Unit Cooling



ho_0720-2

- A single fan (near the front door) draws in fresh air from outside the machine and blows it across the heat sink.
- An exhaust fan has been added to each development unit to draw hot air away from the heat sink.

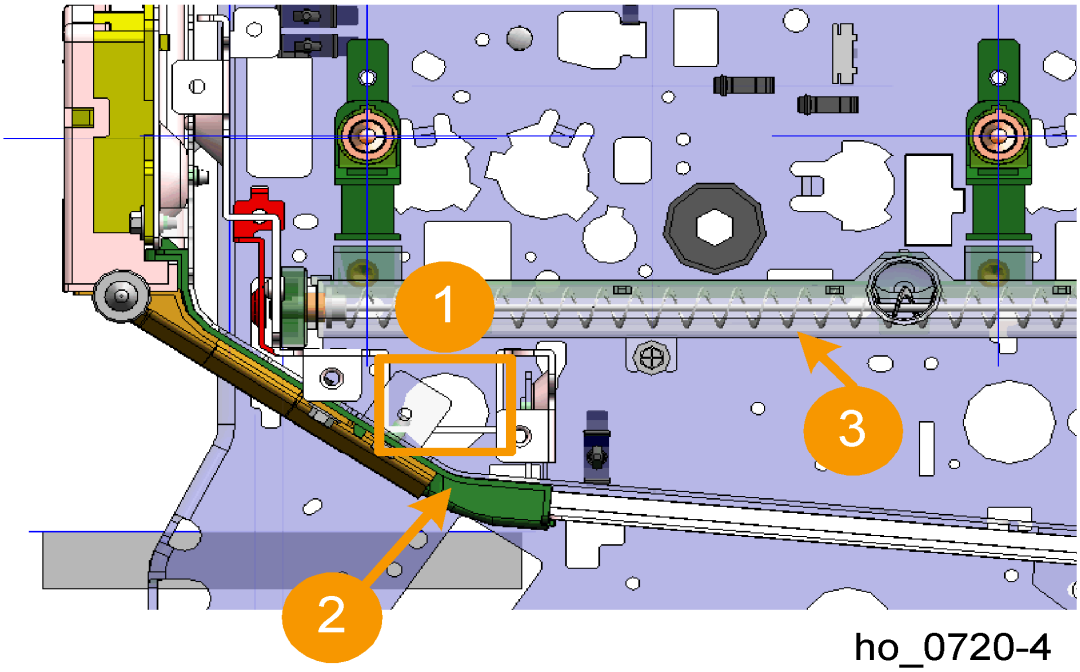
2. The heat pipe panels over the fusing unit have been overhauled.



ho_0720-3

- The number of heat pipes has been increased and they have been rearranged.
- The heat sink cooling fan has been replaced with a fan with a more powerful motor that can move more air.

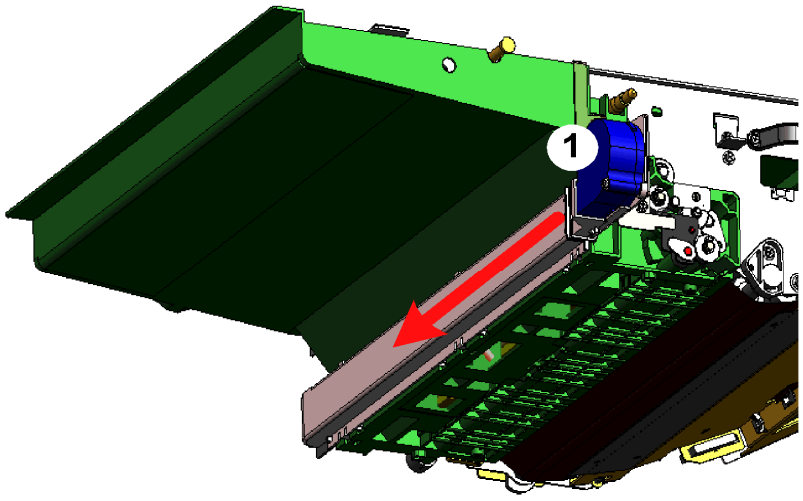
3. The used toner pipe path has been extended.



ho_0720-4

- The air vent □ below the Y PCU has been enlarged so that it can handle a greater volume of air. □ is the heat pipe, □ is the used toner conduit.
- Air is drawn into the vent from the fan at the front door.

4. New cooling airflow duct



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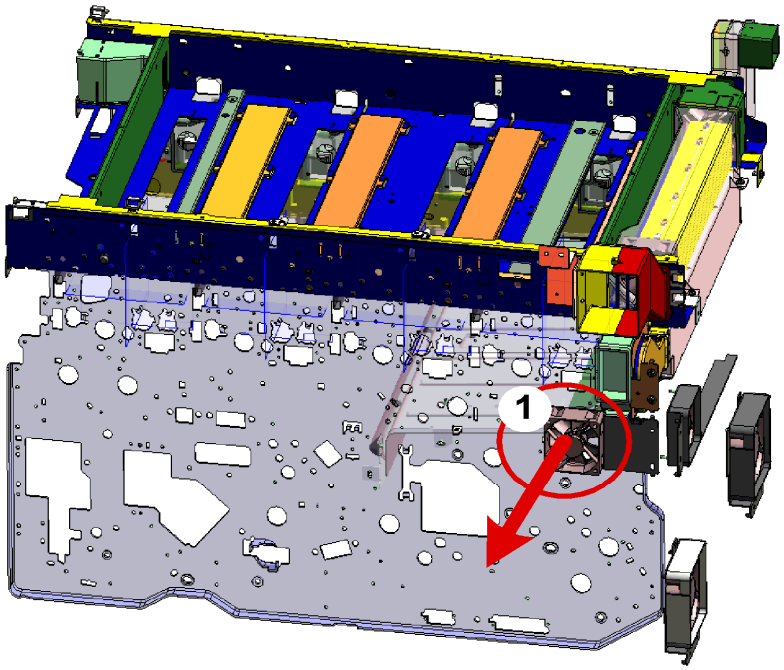
An air flow duct 1 has been added to the ITB cleaning unit to improve ventilation.

5. New cooling fan for the paper drive unit

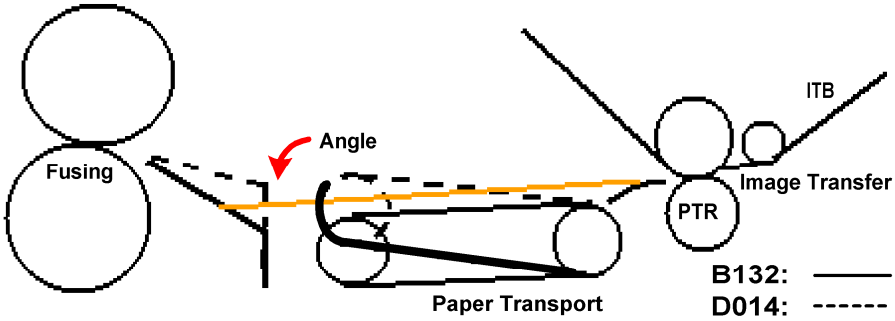


ho_0819-2

A cooling fan □ has been added to the paper drive unit to improve ventilation.

Paper Feed

1. Handling Thick Paper

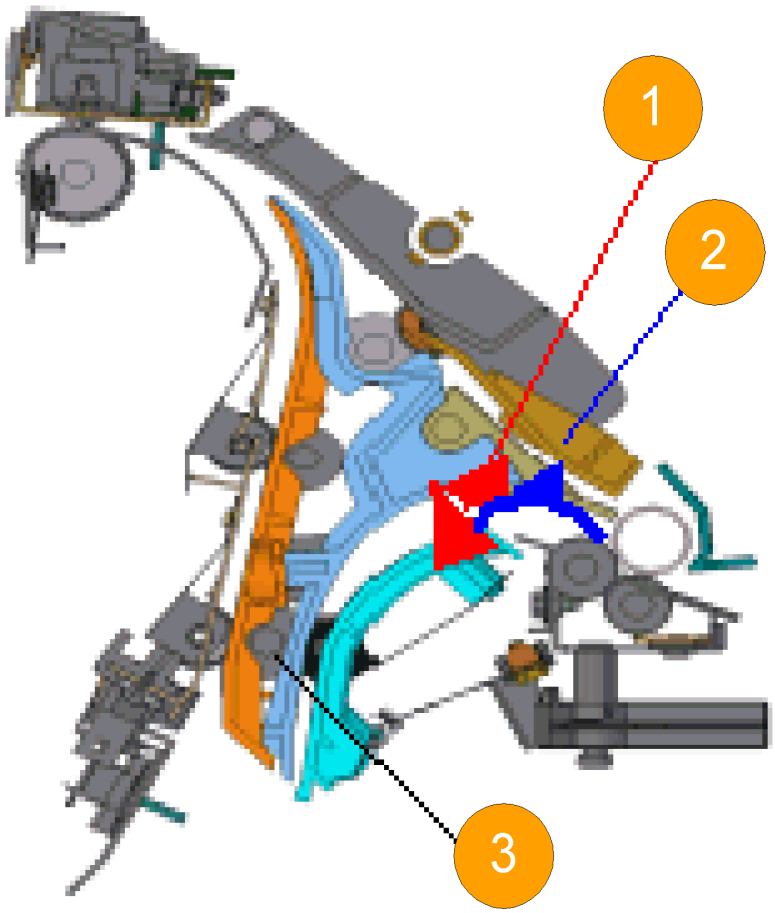


As shown in the diagram above, the paper feed path has been changed. The dotted lines show the shape of the paper feed path of the D014/D015, the solid lines the path in the B132/B200.

- The paper transport unit and the fusing unit entrance guide were both raised, so the angle is much shallower. The change in the angle allows thick paper to feed much easier. Even 300 g A4 LEF paper can now feed more efficiently.
- The area where the paper contacts the transport belt has also been enlarged.

Paper Output

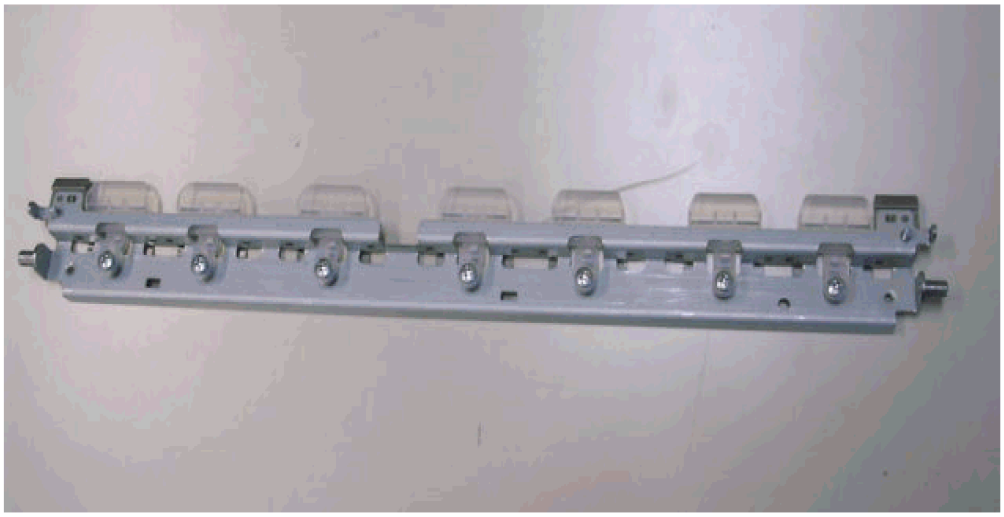
The amount of paper curl (compared with the B132/B200) has been reduced.



ho_0720-6

- To reduce the amount of buckling of the paper in the paper path, the inverter relay roller 3 feeds all paper at the same speed after it passes the de-curler. The gap between the guide plates 1 was enlarged.
- The curvature 2 of the turn in the paper path between the de-curler and the junction gate has been enlarged.
- Inverter relay roller 3 has been added.

Elimination of Pawl Marks on Prints



d014n001

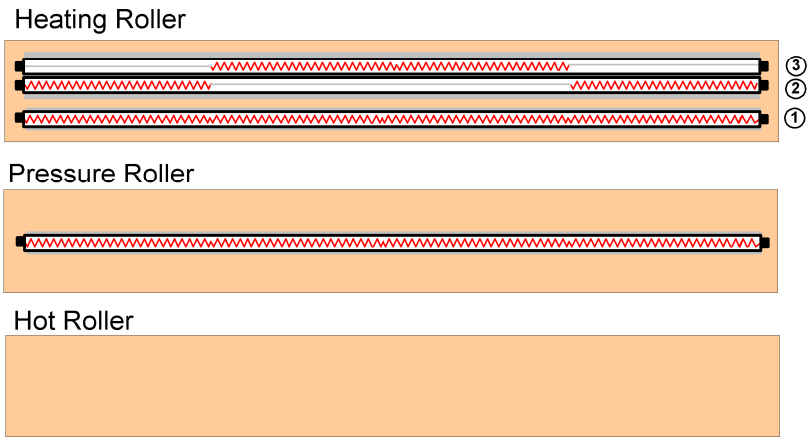
A new fusing belt stripper eliminates shiny stripper marks on prints.

- A new stripper plate has been designed to strip copies that occasionally stick to the fusing belt. The points of the stripper plate are flat PFA resin plates, not sharp points.
- The new PxP toner, which contains a new type of wax, separates more easily from the belt so the sheet is less likely to stick to the fusing belt.
- The new soft-sponge material of the hot roller also means that paper is less likely to stick to the fusing belt.

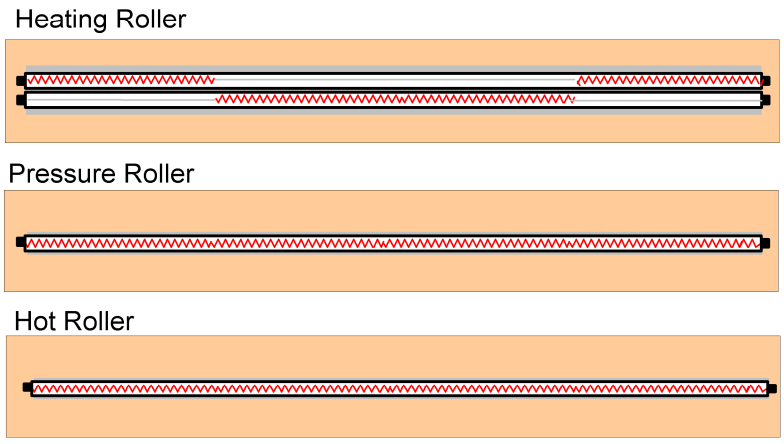
Fusing Lamp Rearrangement in the Heating Roller

The layout of the fusing lamps has been rearranged to ensure a more efficient distribution of heat.

D014/D015



B132/B181/B200



temp_fusinglamps

In the Heating Roller:

- Lamp 1 heats the entire length of the fusing belt.
- Lamp 2 heats only the ends of the fusing belt. (Used only for large paper sizes.)
- Lamp 3 heats only the center of the fusing belt. (Used for smaller, thick paper sizes; lamp 2 is not used.)

This allows better control of the heat applied to the fusing belt, based on the requirements of the paper size and paper type selected for the job.

Reduction of Pressure on the Hot Roller

A new pressure roller lift mechanism has been adopted to raise the pressure roller and keep it against the hot roller only while the machine is printing.

At the end of the job, the pressure roller is lowered and separated from the hot roller.

If the pressure roller remains pressed up against the soft sponge material of the hot roller while the machine is idle, this could permanently warp the shape of the soft hot roller and cause problems during image transfer from belt to paper.

Handling Thicker Paper

The D014/D015 can handle paper weights up to 300 g/m^2 (110 lb Cover). This is a significant improvement.

The time in the nip for thick paper (Thickness 2) with the B132/B200 was 80 ms. The time in the nip for Thick 1 with the D014/D015 is 100 ms.

For thick paper:

- The nip of the D014/D015 is wider than the nip of the B132/B200.
- The line speed of the D014/D015 adjusts to slower speeds to match the thickness of the paper.

Other modifications were done to allow handling thicker paper:

- A guide mylar was added at the "turn" where the paper feeds from the paper trays, to reduce the amount of bending on the leading edge of paper as it leaves the tray.
- The paper path from the bypass tray was changed to straighten the paper path from feeding> registration> image transfer. This makes feeding thick A4 LEF much easier.
- The paper path of the duplex unit was modified slightly to reduce bending in paper at the "turn", and the junction gate solenoid has more strength to handle thicker paper.

The table below shows significant improvement in handling thicker paper.

Feed Station	B132/B200	D014/D015	UP
Paper Tray	52.3 to 127 g/m^2 14 to 47 lb. Cover	52.3 to 216 g/m^2 14 to 80 lb. Cover	70%
Bypass	52.3 to 256 g/m^2 14 to 94 lb. Cover	52.3 to 300 g/m^2 14 to 110 lb. Cover	17%

Feed Station	B132/B200	D014/D015	UP
Duplexer	64 to 127.9 g/m^2 17 to 47 lb. Cover	64 to 163 g/m^2 17 to 90 lb. Cover	27%

Operability

Some improvements have been done for the operator.

Handling Paper Jams

The B132/B200 displayed only a message to alert the operator about a jam or double-feed. The D014/D015 has a fully animated system to guide the operator step-by-step through jam removal.

Easier Use of Paper Tray End Fence

With the B132/B200, the operator must push and hold down a side lever while moving the end fence. With the D014/D015, the operator need only press the end fence slightly to move it to the position for a standard paper size.

New Arrow Indicator on Side Fence Lever

An arrow indicator embossed on the side fence reminds the operator where to push to release and move the side fence.

Image Quality Improvement

This section describes the changes that have been implemented to improve image quality for the D014/D015.

Adoption of Single-Direction Developer/Toner Supply

The adoption of the single-direction developer/toner supply method has resulted in the following improvements.

- **Uniformity of Image Density**

  With the B132/B200, there are minor problems with images becoming faint (front to back) because the agitator moves the toner front to back. There were variations of less than 25% with the B132/B200, but this has been reduced to less than 15% with the D014/D015. This reduction was made possible with the adoption of a one-direction development system in the development units.

- **Stabilization of Image Quality**

  B132/B200 image quality shows some repeat density fluctuation (0.15), but this has been reduced with the D014/D015. The improvement was achieved by using a stable-density development system.

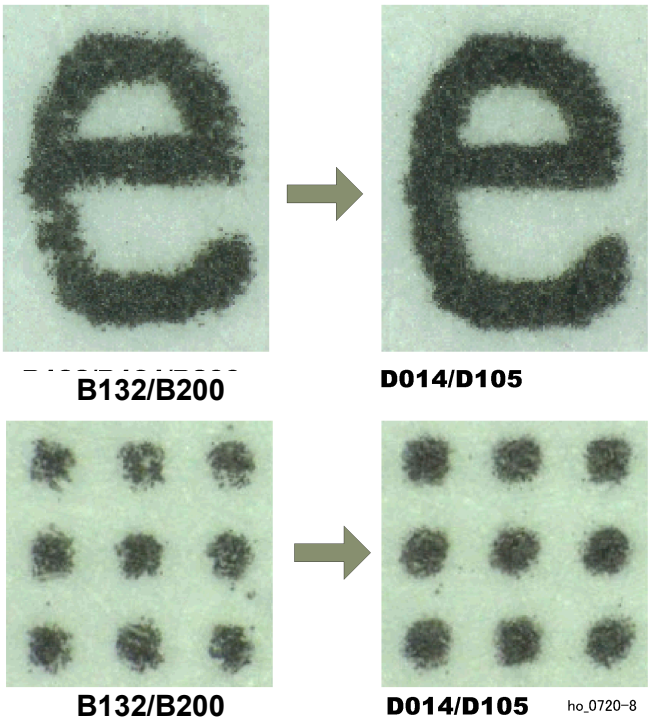
- **Stabilization of High Quality Images**

  With the B132/B200, it was found that there was some image deterioration in high quality images created with high duty coverage during continuous paper feed. (image quality deteriorated after about 20K copies). The improvement was achieved by adoption of the developer/toner pre-mixing system.

Adoption of New PxP Toner

The adoption of the new PxP toner has achieved the following dramatic improvements in image quality.

Granularity, Reproduction of Dots



The difference in the granularity of B132/B200 pulverized toner (6.8 μm) and D014/D015 PxP toner (5 μm) toner has a significant effect on image quality. The D014/D015 toner with toner granules of smaller diameter reproduces a much better image with dots of 0.4, compared with 0.5 of the B132/B200.

Sharpening Text

ho_0720-8a

There were requests from customers for sharper reproduction of text characters (reducing the "halo" effect around text characters). Better text reproduction was achieved with better control over the rotation of the development roller and drum and changing the ratio of their rotation. The drum and development roller are driven by separate motors in the D014/D015.

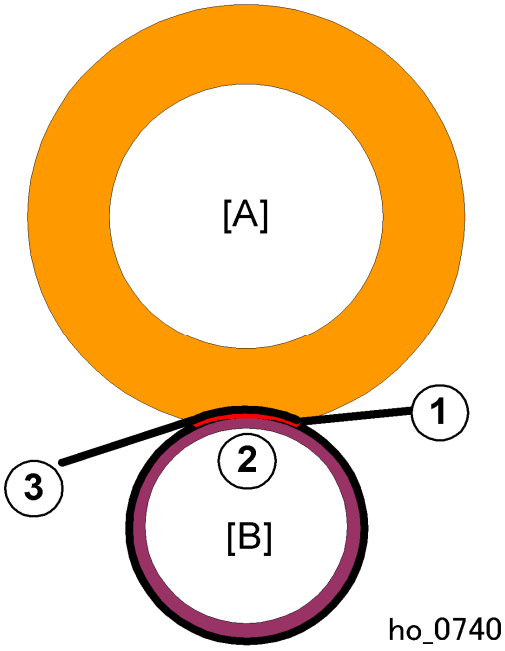
- **Blurring at the Trailing Edges of Images**

  Many customers requested elimination of the blurring at the trailing edges of images. This problem was solved with the development rollers and OPC drums rotating slightly slower relative to line speed.

Elimination of Shiny Pawl Marks on Prints

Many customers requested elimination of the shiny streaks at the trailing edges of sheets that were caused by the strippers that removed paper from the fusing belt.

The problem of paper separation from the fusing belt was solved in two ways:



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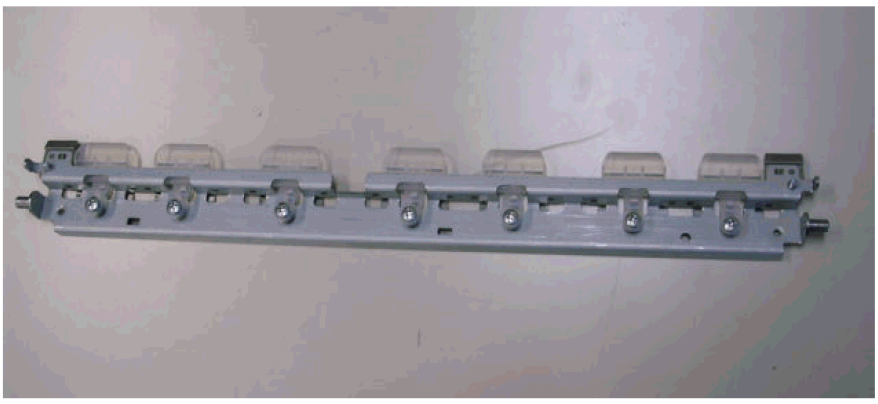
- The design of the fusing unit was changed. The hot roller [A] is composed of soft sponge. When the pressure roller [B] presses into the hot roller from below this creates a much wider nip. The paper □ enters the wider nip □ and when it exits the nip at □ the curvature of the nip points the paper downward. This improves separation of the paper from the fusing belt.



d014n001

- The fusing belt strippers were replaced by a new stripper plate equipped with flat soft plates (not points) that will not leave marks on the paper.

Comparison of Changes in Basic Operation

<table>
<tr><th></th><th colspan="3">D014/D015</th><th colspan="2">B132/B200</th></tr>
<tr><td rowspan="2">Copy Speed</td><td>D014</td><td colspan="2">FC: 55 cpm,
B&W: 60 cpm</td><td>B132/B200</td><td>FC: 45 cpm,
B&W 60 cpm</td></tr>
<tr><td>D015</td><td colspan="2">FC: 70 cpm
B&W: 75 cpm</td><td>B132/B200</td><td>FC: 55 cpm B&W: 60 cpm</td></tr>
<tr><td rowspan="3">Warm-up Time</td><td>EU/AP</td><td colspan="2">Less than 75 sec.</td><td colspan="2" rowspan="3">< 300 sec.</td></tr>
<tr><td>NA</td><td>D014/D015</td><td>< 90 sec.</td></tr>
<tr><td>D014/D015</td><td>< 75 sec.</td><td></td></tr>
<tr><td rowspan="4">First Copy</td><td>FC</td><td>D014/D015</td><td>7.5 sec.</td><td colspan="2" rowspan="2">7.5 sec.</td></tr>
<tr><td>D014/D015</td><td>6.4 sec.</td><td></td></tr>
<tr><td>B&W</td><td>D014/D015</td><td>5.7 sec.</td><td colspan="2" rowspan="2">6.5 sec.</td></tr>
<tr><td>D014/D015</td><td>4.9 sec.</td><td></td></tr>
<tr><td rowspan="2">Power Specifications</td><td>NA</td><td colspan="2">D014: 120V 16A 60 Hz
D015: 208-240V 12A 60 Hz</td><td colspan="2">120V
16A 60 Hz</td></tr>
<tr><td>EU/AP</td><td colspan="2">220-240V 12A 50-60 Hz</td><td colspan="2">220 to 240V
8.7A 50/60 Hz</td></tr>
</table>

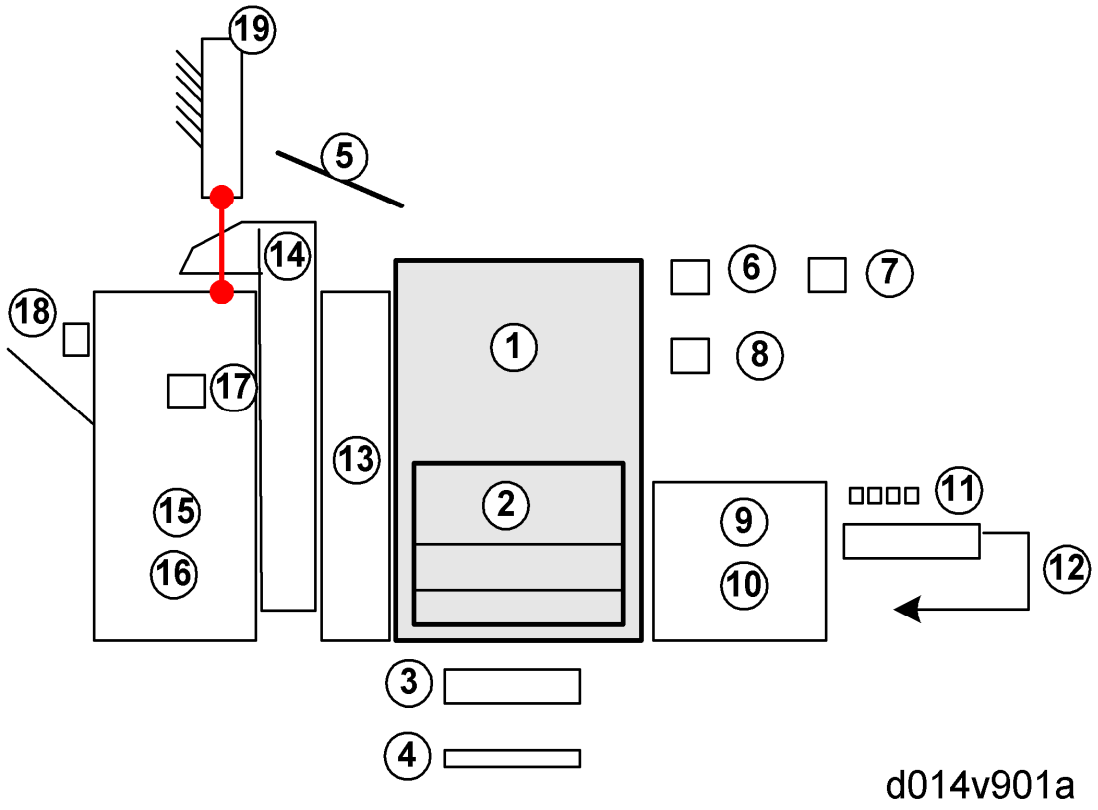
Max Power Consumption	NA	D014: Less than 1920W D015: Less than 2400W	< 1920 W
	EU/AP	D014/D015: Less than 2400W	< 1920 W
Line Speed			
Normal Paper	D014: 282 mm/s D015: 352.8 mm/s		B132/B200 282 mm/s
Thick Paper	D014/D015: Thk 1: 176.4 mm/s, Thk 2, Thk 3: 141 mm/s		B132/B200: 141 mm/s
OHP	D014/D015 141 mm/s		B132/B200 100 mm/s

Comments

- **Warm-up Time**. The warm-up time is much faster. This is achieved with the newly designed fusing unit and low melting-point toner.
- **First Copy**. The first copy time is much faster due to the adoption of the new fusing unit and low melting-point toner.

System Configuration and New Options

Configuration 1 (with D373/D374 Finisher)

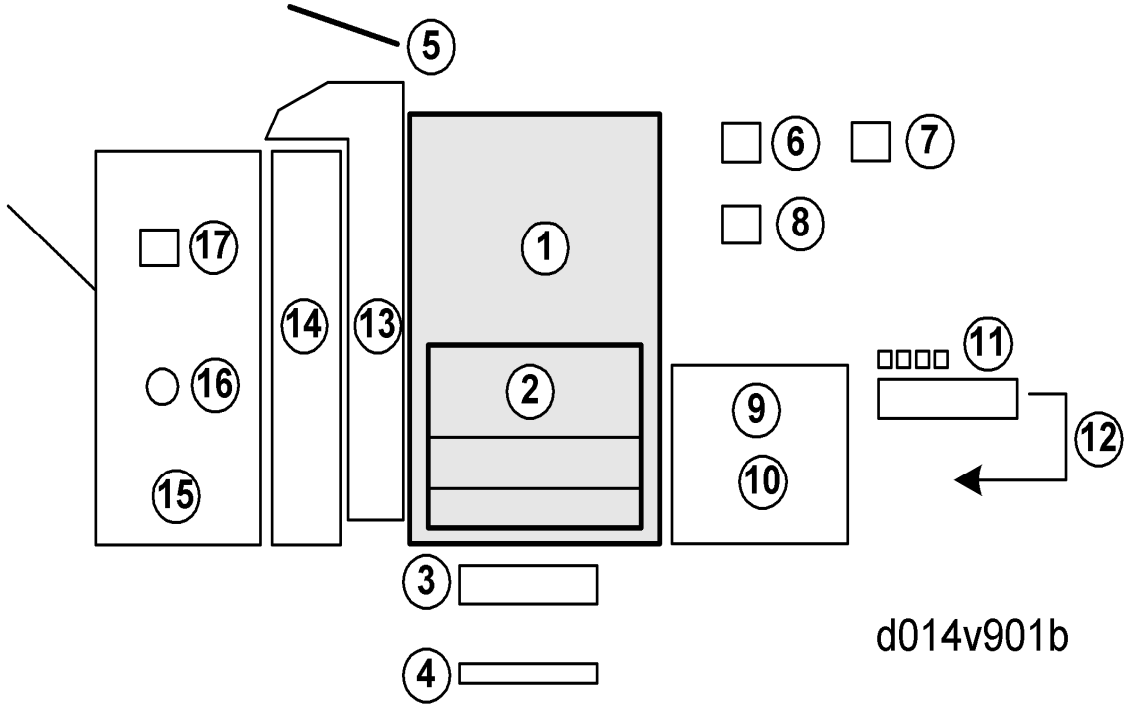


No.	Item	Comments
①	D014/D015	Main unit
②	Tandem Tray	Built into main unit
③	A3/11"x17" Tray Type (B331)	Option for tandem tray
④	Tab Sheet Holder Type (B499)	Option for universal tray
⑤	Copy Tray (B756)	For no finishers
⑥	Key Counter Bracket (B452)	Counter option

No.	Item	Comments
⑦	Key Counter Interface Unit Type (A) (B870)	Board required for key counter
⑧	Card Reader Bracket (B498)	Counter option
⑨	LCT 4000 (D350) *1	Only one of these options can be installed.
⑩	A4/LT LCT (B473)	
⑪	LCT Adapter (B699)	Required for LCT B473
⑫	LG Unit for A4/LT LCT (B474)	Option for LCT B473
⑬	Z-Folding Unit ZF4000 (B660) *1	
⑭	Cover Interposer Tray (B704)	For D373 (2000-sheet), D374 (3000-sheet) finishers only. Only 1 tray. Cannot be installed with Mail Box (B762).
⑮	Finisher SR4020 (D373) *1	2000-sheet finisher, 50 staple, Booklet folding and stapling
⑯	Finisher SR4010 (D374) *1	3000-sheet finisher, 50 staple, corner stapling only
⑰	Punch Unit (B702)	For either finisher D373 or D374
⑱	Output Jogger Unit (B703)	For either finisher D373 or D374
⑲	Mail Box CS391 (B762)	For D373 (2000-sheet), D374 (3000-sheet finishers only). Cannot be installed with Cover Interposer Tray (B704)

*1 New options for this machine.

Configuration 2 (with B830 Finisher)



No.	Item	Comments
①	D014/D015	Main unit
②	Tandem Tray	Built into main unit
③	A3/11"x17" Tray Type (B331)	Option for tandem tray
④	Tab Sheet Holder Type (B499)	Option for universal tray
⑤	Copy Tray (B756)	For no finishers
⑥	Key Counter Bracket (B452)	Counter option
⑦	Key Counter Interface Unit Type A (B870)	Board

No.	Item	Comments
⑧	Card Reader Bracket (B498)	Counter option
⑨	LCT 4000 (D350	Only one can be installed.
⑩	A4/LT LCT (B473)	
⑪	LCT Adapter (B699)	Required for LCT B473 to adjust height.
⑫	LG Unit for A4/LT LCT (B474)	Option for LCT B473
⑬	Cover Interposer Tray CI 5000 (B835)	Two source trays. Can be installed with 3000-sheet finisher B830 only.
⑭	Z-Folding Unit ZF4000 (B660)	Can be installed with D373, D374, B830 finishers.
⑮	Finisher SR5000 (B830)	3000-Sheet finisher, 100 staples, jogger standard.
⑯	Finisher Adapter (D375)	For Finisher B830
⑰	Punch Unit PU 5000 (B831)	For 3000-sheet finisher B830 only.

New Options for D014/D015

These are the options available for D014/D015. Only the LCIT 4000 (D350) is a new model. The other options are used with other Ricoh machines.

New Peripheral

- **LCT 4000 (D350)**. New but based on the design of the B834 introduced with the B286. The D350 has only one 2,000 sheet tray.

Other Peripherals

- **Finisher SR4020 (D373)**. 2000-sheet booklet finisher (50 staple). Capable of both corner and booklet stapling.
- **Finisher SR4010 (D374)**. 3000-sheet booklet finisher (50 staple). Basically the same as the SR4020 but features corner stapling only.
- **Finisher SR5000 (B830).** Requires an adapter kit to accommodate the faster speed of the D014/D015. A jogger unit is built-in (no installation required).
- ***Z*-Folding Unit ZF4000 (B660)**. Can be installed with the 2000-Sheet Finisher (D373), 3000-Sheet Finisher (D374), or 3000-Sheet Finisher (B830).
- **Cover Interposer Tray CI 5000 (B835)**. Equipped with two trays for feeding slip sheets. Installed on the 3000-Sheet Finisher B830 only.
- **Cover Interposer Tray (B704)**. Equipped with one tray for feeding slip sheets. Installed on the 2000-Sheet Finisher (D373) or 3000-Sheet Finisher (D374). Cannot be installed with Mail Box B762.
- **Mail Box (B762)**. Installed on the 2000-Sheet Finisher (D373) or 3000-Sheet Finisher (D374). Cannot be installed with Cover Interposer Tray (B704).
- **Fax Option Type C7500**. The base fax unit can accommodate both G3 and G4 boards, but only G3 will be available overseas. (The G4 option will be available only in Japan.)

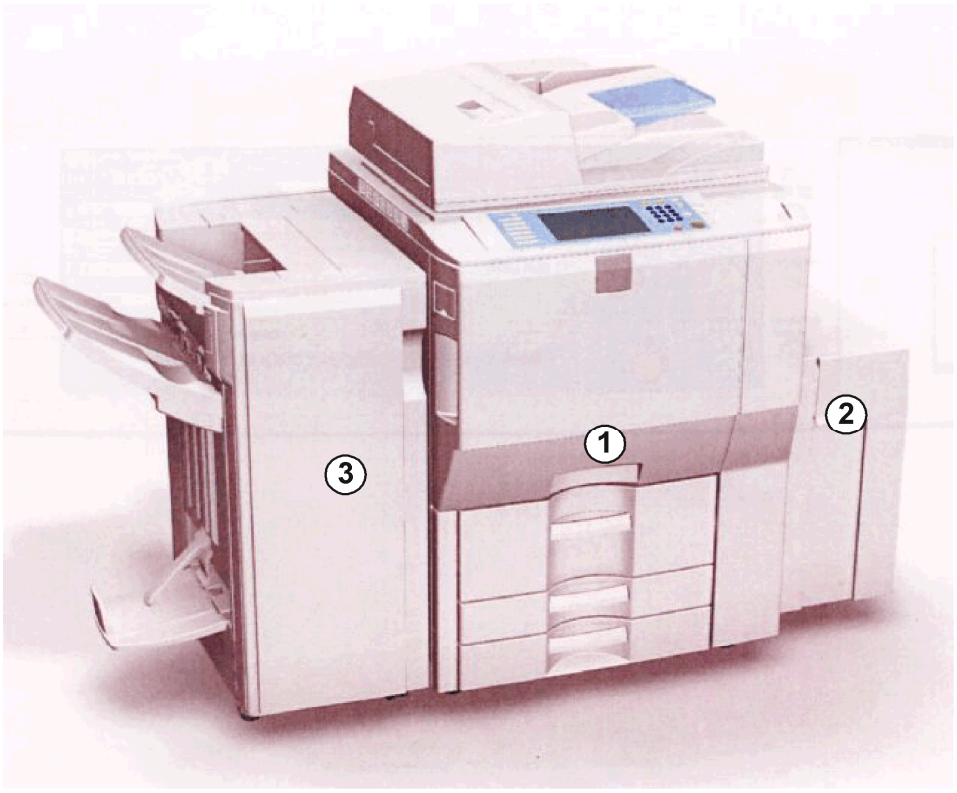
MFP Options (Listed Alphabetically)

Option	Prod. No.	Config.
Bluetooth Interface Unit Type 3245	B826	Board
Browser Unit Type D	D377	SD Card
Copy Connector Type 2105	B328	Board
Copy Data Security Unit Type F	B829	Board
Data Overwrite Security Unit Type H	D377	SD Card
Fax Option Type C7500	D336	Board
File Format Converter Type E	D377	Board
G3 Interface Unit Type 7500	D357	Board
Gigabit Ethernet D377*[1]	D377	Board
HDD Encryption Unit Type A	D377	SD Card
IEEE 1284 Interface Board Type A	B679	Board
IEEE802.11a/g Interface Unit Type J	D377	Board
IEEE802.11g Interface Unit Type K	D377	Board
Java VM Card Type E	D377	SD Card
PostScript 3 Unit Type C7500	D378	SD Card
Printer/Scanner Unit Type 7500	D376	SD Card

*[1]: The EFI (Fiery) Controller currently under development will be connected via the Gigabit Ethernet Board.

Appearance of Actual Configurations

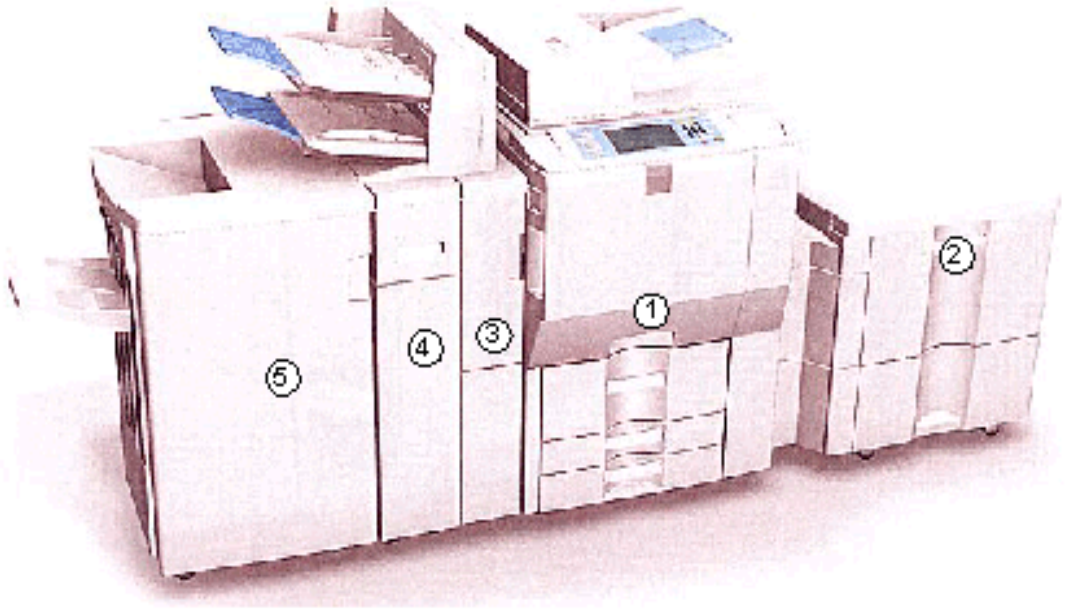
Configuration Sample for General Office Customers



d014v901d

No.	Item	Comments
①	D014/D015	Main unit
②	LCT 473	Option
③	Finisher SR4020 (D373)	2000-sheet finisher, 50 staple, Booklet folding and stapling

Configuration Sample for Light Production Customers



d014v901c

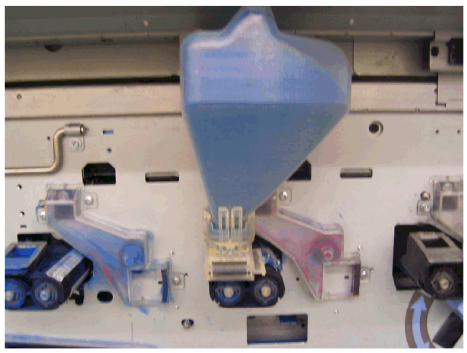
No.	Item	Comments
①	D014/D015	Main unit
②	LCT 4000 (D350)	New option.
③	Cover Interposer Tray CI 5000 (B835)	Two source trays.
④	Z-Folding Unit ZF4000 (B660)	
⑤	Finisher SR5000 (B830)	

More Details About Design Changes

This is a summary of the most important design changes in the D014/D015. For more details, please refer to Section 6 of the D014/D015 manual.

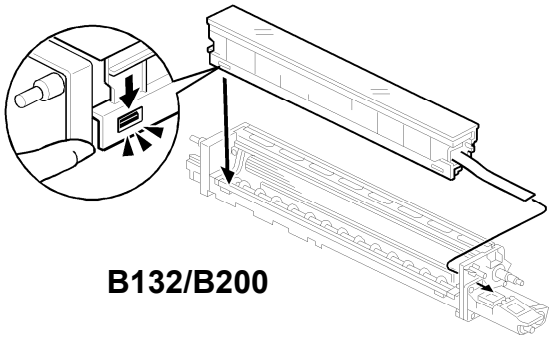
PCU (Photoconductor Unit)

Developer Filling, Replacement



D014/D015

ho_0730



B132/B200

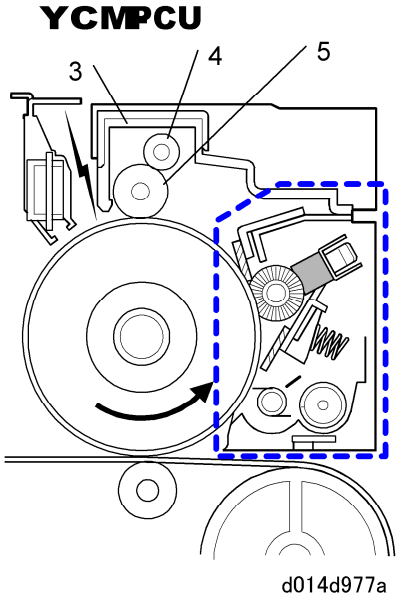
b132i106

The B132/B200 uses a plastic developer container installed inside the PCU. With the D014/D015, the developer is poured from a newly designed developer bottle attached to the front end of a PCU. After filling, the bottle is detached and discarded. With the D014/D015, it is not necessary to remove the PCUs from the machine in order to fill them with developer.

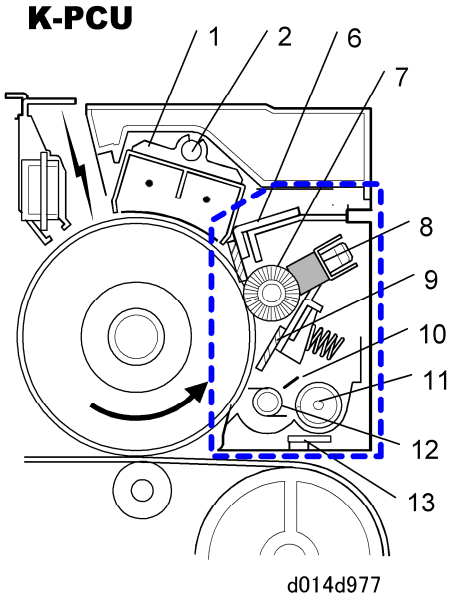
PCU Design

The PCU units have been redesigned. In the previous model, all the PCUs had the same structure. In this machine, the K PCU employs the charge corona wire system that is commonly used in other machines. The other PCUs (Y, C, M) use charge rollers just like the B132/B200.

Different Designs of YCM PCU and K PCU



d014d977a



d014d977

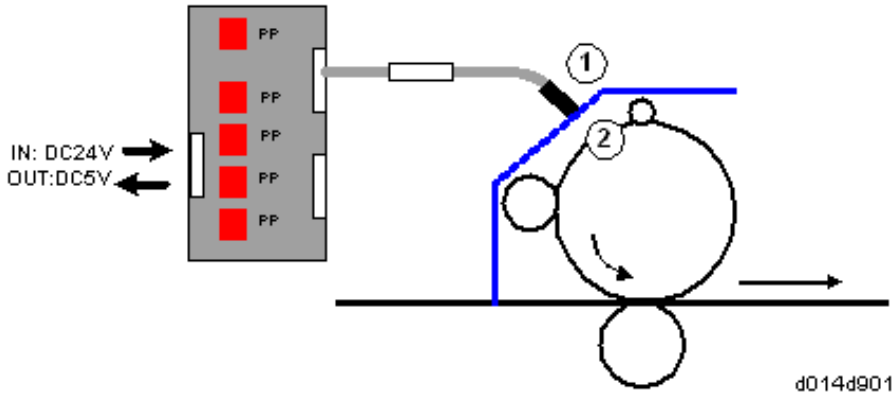
1	Charge Corona Unit (Scorotron type)	Only the K PCU uses a charge corona unit.
2	Charge Corona Wire Cleaner	
3	Charge Roller Unit	The Y, M, C PCUs use charge rollers.
4	Charge Roller Cleaning Roller	
5	Charge Roller	
6	Lubricant Blade	These items comprise the PCU cleaning system. The same parts and system are used in all of the four PCU units.
7	Lubricant Brush Roller	
8	Lubricant Bar	
9	Cleaning Blade	
10	Cleaning Brush Roller Flicker	
11	Toner Collection Coil	
12	Collection Coil	
13	Quenching LED	

Note

- The OPC drums of the B132/B200 and D014/D015 are not interchangeable.

Potential Sensors

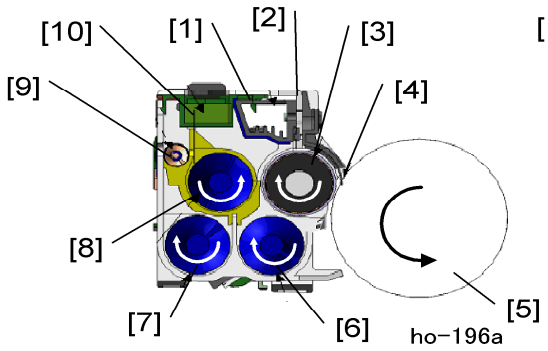
Potential Sensor Position



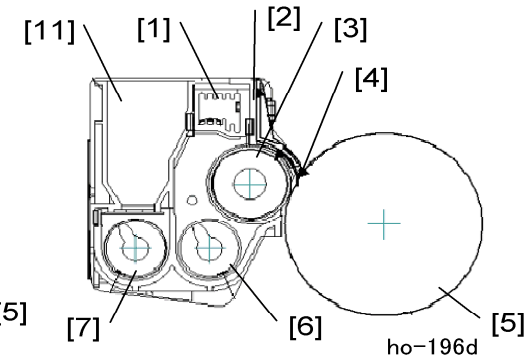
The drum potential sensors (x4) no longer reside inside the PCUs. They are attached to the main machine just above each PCU . This new arrangement keeps the potential sensors free of toner and dust during servicing.

Development Unit

Cross-Section of Development Unit



D014/D015



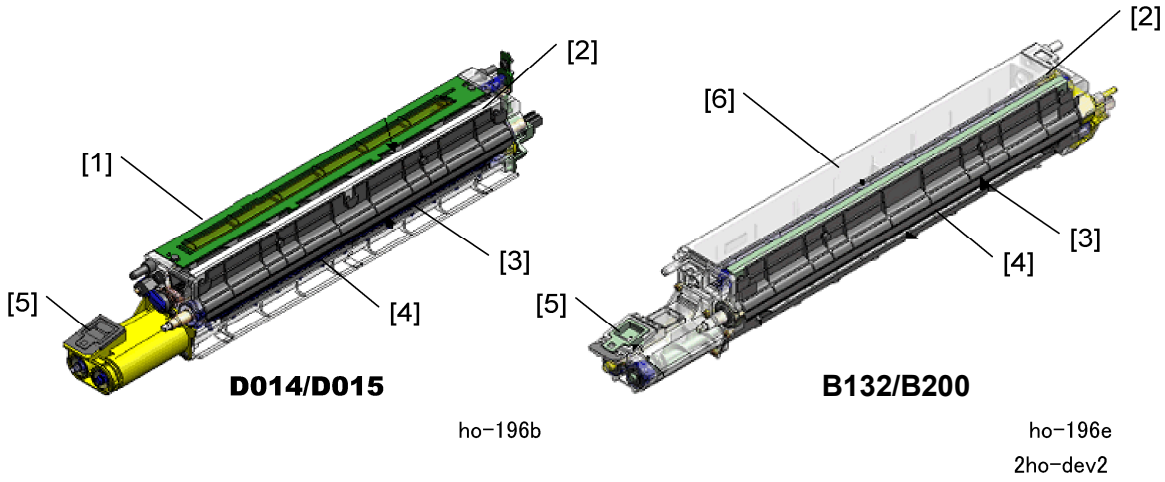
B132/B200

2ho-dev1

	D014/D015	**B132/B200**
1	Heat Sink	Heat Sink
2	Doctor Blade (t=2.0)	Doctor Blade (t=2.0)
3	Development Roller	Development Roller
4	Entrance Seal	Entrance Seal
5	Drum (diameter 60)	Drum (diameter 60)
6	Toner Collection Auger (dia. 22)	Developer Auger 1 (dia. 18)
7	Mixing Auger (diameter 22)	Developer Auger 2 (dia. 18)
8	Supply Auger (dia. 22)	---
9	Used Toner Auger	---
10	Filter	---
	---	Developer Cartridge

Note: The D014/D015 does not contain a developer cartridge. The PCU is filled with developer from a newly designed bottle. The PCU does not need to be removed from the machine in order to fill it with developer.

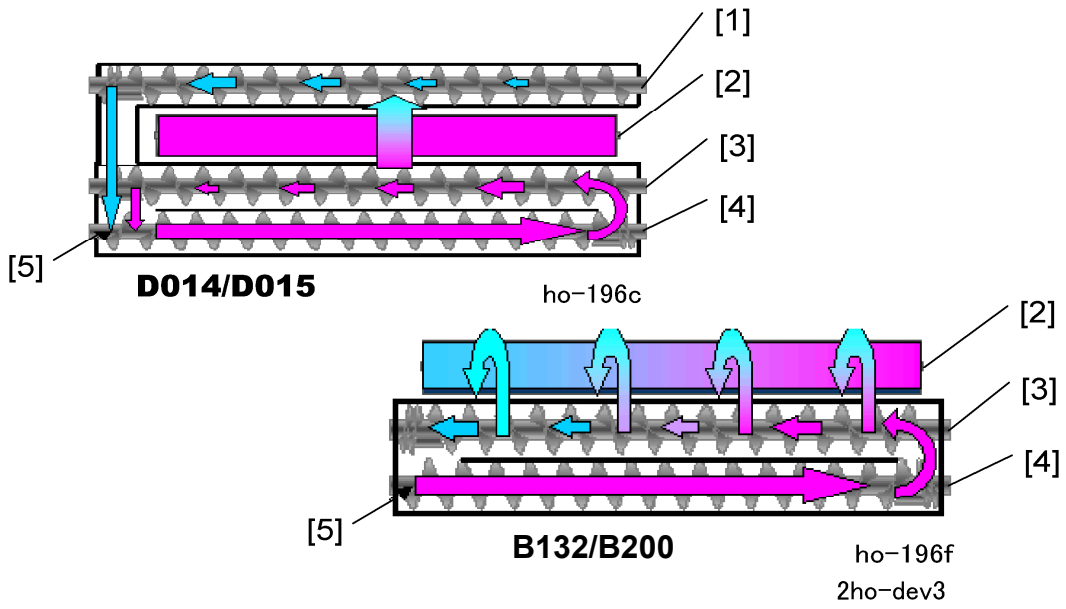
External View of Development Unit



	D014/D015	B132/B200
1	Filter	---
2	Heat Sink	Heat Sink
3	Entrance Seal	Entrance Seal
4	Development Roller (diameter 25)	Development Roller (diameter 25)
5	Toner Supply Port	Toner Supply Port
6	---	Development Cartridge

Note: The D014/D015 does not contain a developer cartridge. The PCU is filled with developer from a newly designed bottle. The PCU does not need to be removed from the machine in order to fill it with developer.

Toner/Developer Flow Inside the Development Unit



	D014/D015	B132/B200
1	Collection Auger (dia. 22)	
2	Development Roller (diameter 25)	Development Roller (diameter 25)
3	Supply Auger (dia. 22)	Developer Auger 1 (diameter 18)
4	Mixing Auger (dia. 22)	Developer Auger 2 (diameter 18)
5	Toner Supply Port	Toner Supply Port

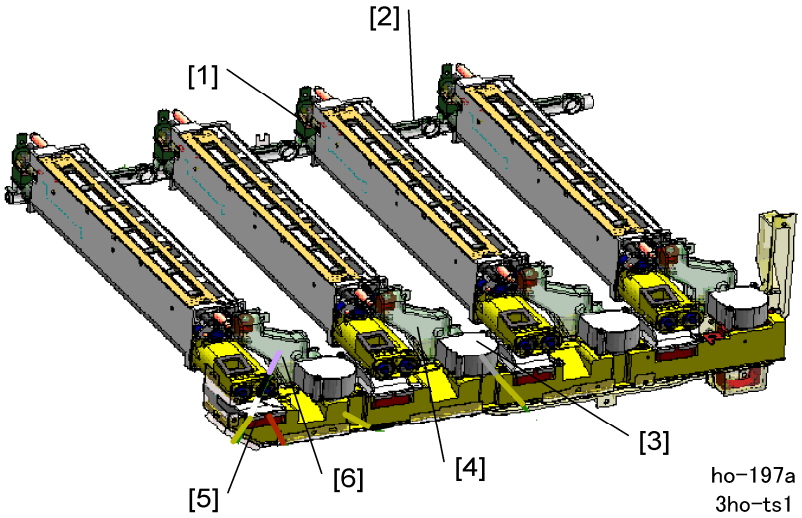
The one-direction flow of developer in the D014/D015 development unit improves image quality.

In the D014/D015, the path for fresh developer is separate from the path that collects excess toner from the doctor blade that smoothes the toner that will be applied to the drum. Compare with the B132/B200 above where this excess toner mixes with fresh toner. The D014/D015 achieves a more even coating of toner on the drum and uses only fresh toner/developer. This means the density of the image is more uniform.

Toner Supply

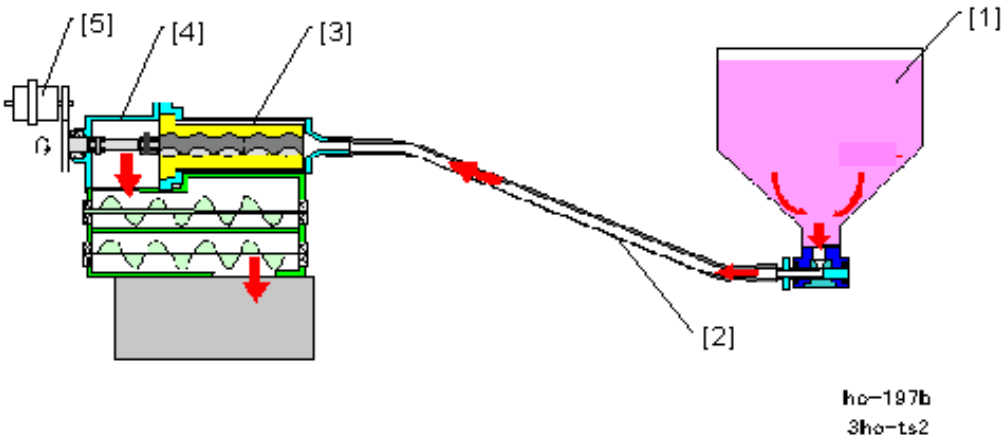
With the exception of a few minor differences, D014/D015 uses the same toner supply system as the previous model.

Toner Supply Components



1	Waste Developer Coil*[1]
2	Horizontal Used Toner Transport Coil
3	Cooling Fan 2 (Doctor Blade)*[1]
4	Cooling Duct 2 (Development Doctor Blade)*[1]
5	Cooling Fan 1 (Below Development Unit)
6	Cooling Duct 1 (Below Development Unit)
	*[1] These are new items.

New STC (Soft Toner Cartridge)



1	Toner Cartridge (STC)
2	Flexible Tubing
3	Toner Pump
4	Toner Pump Clutch
5	Sub Hopper

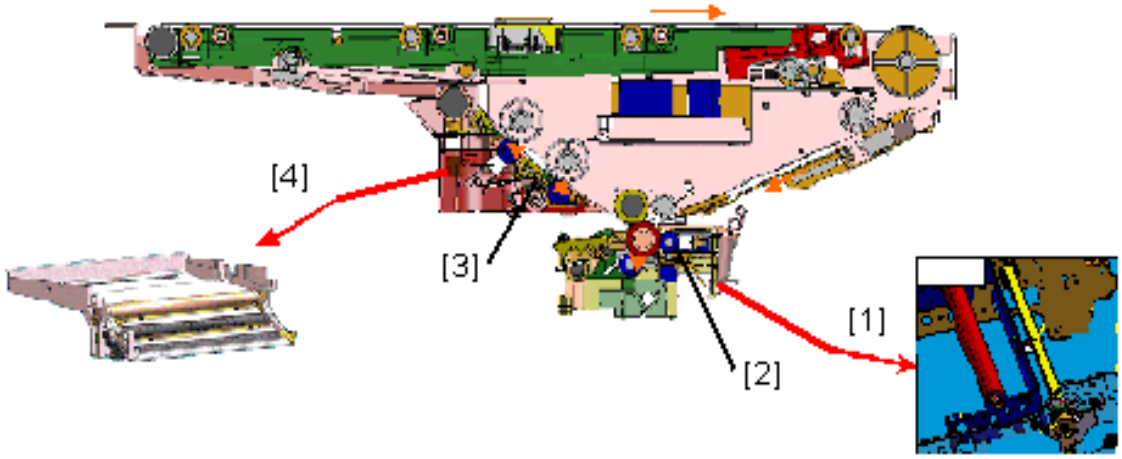
- Four STCs are set in the toner hopper. They are inserted left to right in this order: Y, C, M, K.
- The new PxP toner (high-resolution oil-less Polyester Polymerization toner) used in the D014/D015 has a much lower melting point. For this reason, fans and ducts have been added to the faceplate of the toner supply unit to keep the toner supply cool.
- The toner for the B132/B200 and D014/D015 is not the same, so this means that the STCs of the D014/D015 and the B132/B200 are not interchangeable. Also, the D014/D015 STC contains 90 wt% toner and 10 wt% carrier. The B132/B200 STC contains no developer.

Important

- Neither type of STC can be inserted accidentally in the wrong machine.
- The STC for the D014/D015 does not fit into the B132/B200; a B132/B200 STC does not fit in the D014/D015. However, it is possible to set the wrong type of STC and close the toner hopper even if the wrong type of STC is installed.

Transfer Unit (Image Transfer and Paper Transfer Units)

ITB Unit



ho-198a
4ho-transfer

There are some changes in the transfer unit:

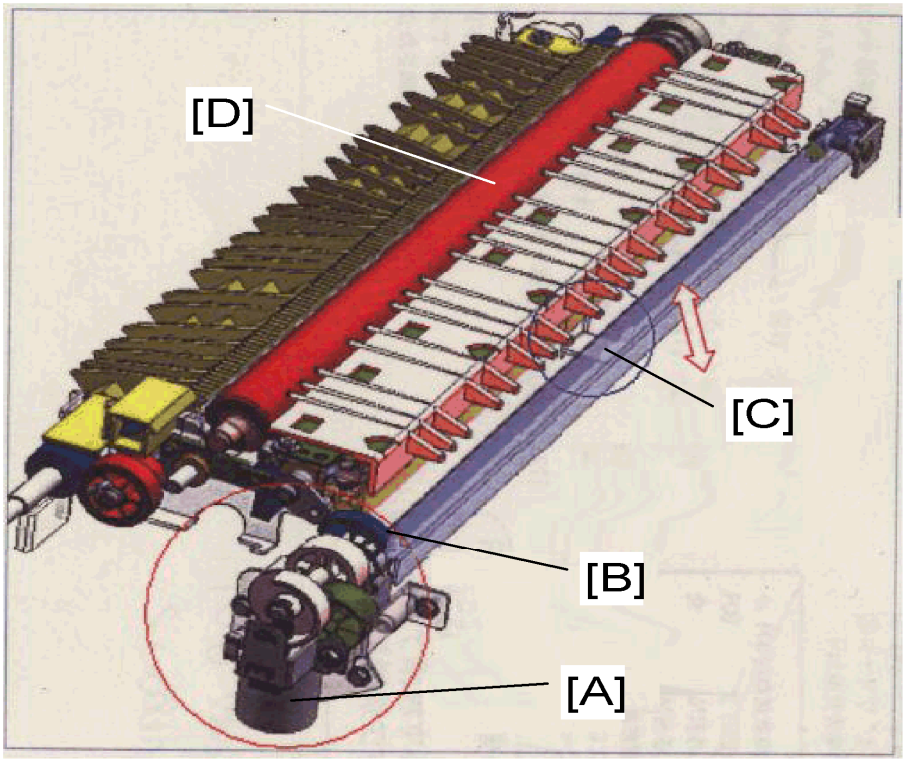
- The PTR lift mechanism [1] has been redesigned. This is the mechanism that keeps the PTR unit against the ITB during belt-to-paper image transfer and lowers the unit when the transfer unit is not operating.
- A lubricant brush [2] has been added to the lubricant bar assembly..
- The toner transport agitator [3] in the ITB cleaning unit [4] is new.
- The cleaning unit of the ITB (shown at the lower left in the diagram above) has also been changed. Two cleaning blades, one cleaning brush roller, and a lubricant bar (ZnSt) comprise the cleaning mechanism. These cleaning blades and roller are PM parts. For a more detailed description, see Section 3 and Section 6.

New PTR Lift Mechanism

The PTR lift mechanism raises and lowers the PTR unit.

- The lift mechanism raises the PTR against the ITB for belt-to-paper image transfer.
- The lift mechanism lowers the PTR and pulls it away from the ITB when the machine is not printing.

PTR Lift Mechanism

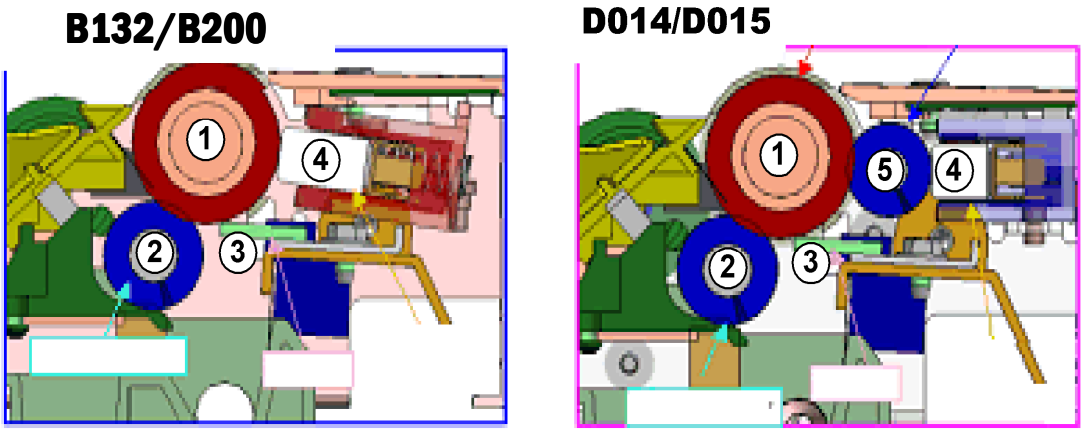


temp_ptu2

The PTR lift motor [A] rotates cam [B]. The rotation of the cam raises and lowers the lift plate [C], which in turn raises and lowers the PTR [D].

This mechanism is necessary because the roller in the ITB unit that opposes the PTR is made of a softer material than in the B132/B200. The PTR will deform this roller if it always contacts it.

Increased Durability of Paper Transfer Roller



ho-0819-4

①	PTR
②	Cleaning Brush Roller
③	Cleaning Blade
④	Lubricant Bar
⑤	Lubricant Brush Roller (D014/D015 only)

1. Reduction of Scratches on PTR

   Scratches on the surface of the PTR caused by foreign particles are a problem with the B132/B200. Also, there is some scratching on the belt caused by the lubricant bar being in direct contact with the roller

   In the D014/D015, the lubricant bar does not touch the roller. The lubricant brush roller □ picks up the lubricant (ZnSt) from the lubricant bar and applies the lubricant to the surface of the roller. This dramatically reduces the amount of scratching on the surface of the PTR and extends the life of the roller and the cleaning unit parts.

2. PTR layer cracking

   The service life of the PTR has been extended to 600K.

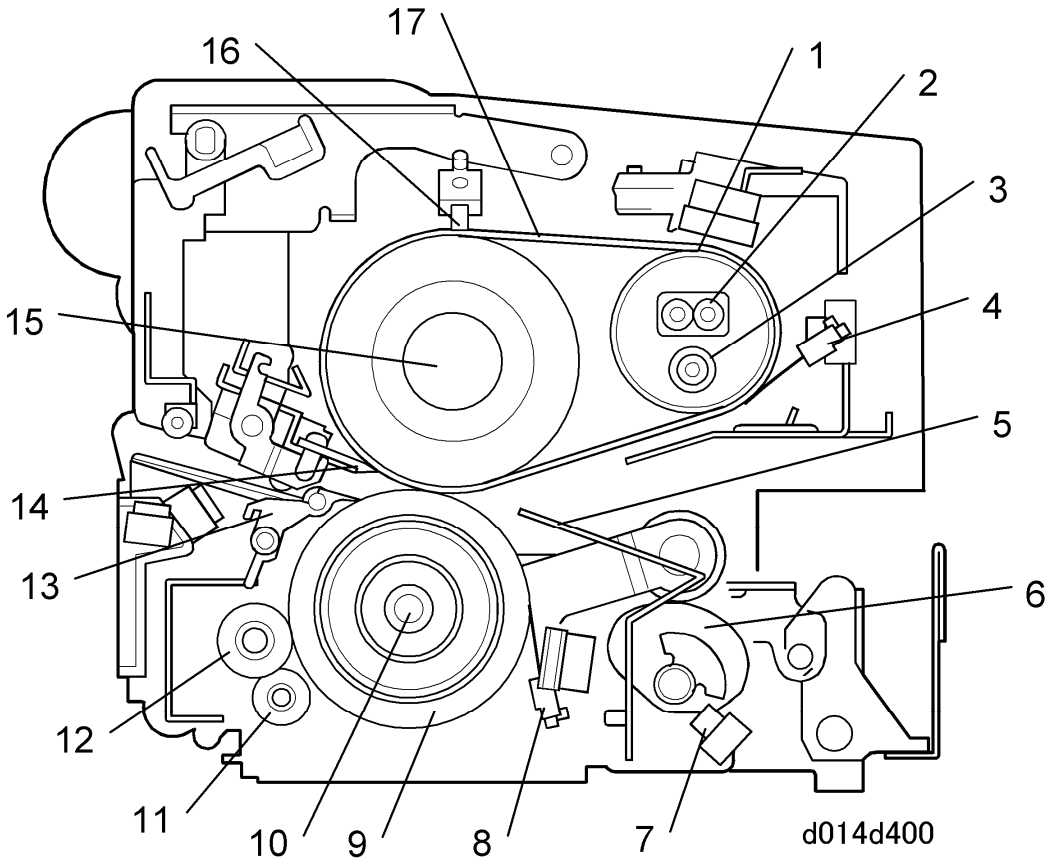
   Cracking between the layers of the PTR occurs in the B132/B200, resulting in its short service life: 150K. This cracking is caused by uneven pressure at the nip of the PTR and paper transfer bias roller above.

   To equalize this pressure at the nip between the ITB bias roller (opposite the PTR in the ITB) and the PTR in the D014/D015, the ITB bias roller of the D014/D015 is composed of softer material. This extends the service life of the D014/D015 PTR to 300K.

Fusing Unit

A fusing belt and three fusing rollers comprise the new fusing unit. The rollers are the heating roller (fusing lamps x3), pressure roller (fusing lamp x1), and hot roller (no fusing lamps). The hot roller is composed of a new, soft sponge material that creates a wider nip band where a more even pressure is applied for fusing.

General Layout of Fusing Unit



1.	Heating Roller	10.	Pressure Roller Fusing Lamp
2.	Heating Roller Fusing Lamps x2	11.	Cleaning Roller
3.	Heating Roller Fusing Lamp x1	12.	Oil Supply Roller
4.	Heating Roller Thermistor	13.	Pressure Roller Strippers
5.	Entrance Guide	14.	Fusing Belt Strippers
6.	Pressure Roller Lift Mechanism	15.	Hot Roller
7.	Pressure Roller Lift Sensor	16.	Fusing Belt Thermistor
8.	Pressure Roller Thermistor	17.	Fusing Belt
9.	Pressure Roller		

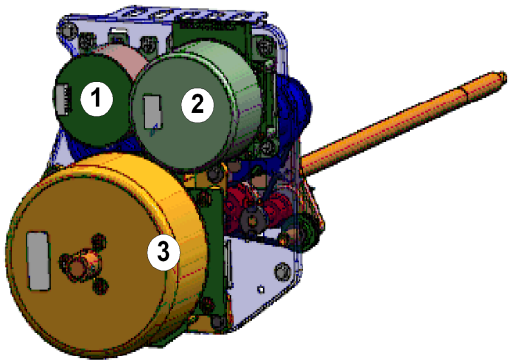
New Pressure Roller Lift Mechanism

A new pressure roller lift mechanism raises and lowers the pressure roller. When fusing starts, the pressure roller lift motor switches on and raises the pressure roller against the hot roller above. At the end of the job, the motor reverses and lowers the pressure roller away from the hot roller. The hot roller and pressure roller remain separated while they are idle. This prevents the pressure roller and hot roller from warping, and prolongs their service lives.

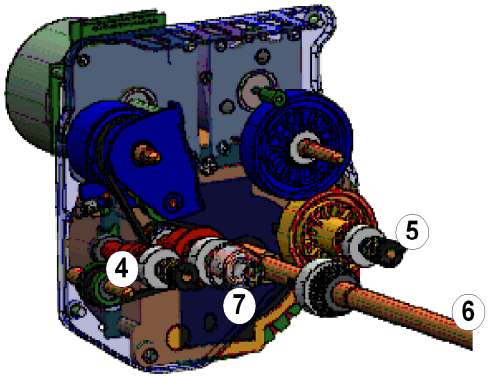
Motors

The following illustrations show the positions of motors around the drum, as viewed from the rear.

Front, Rear View of Drum Cleaning, Development, Drum Motors



Front ho-200a



Rear ho-200b

6ho-mtr1

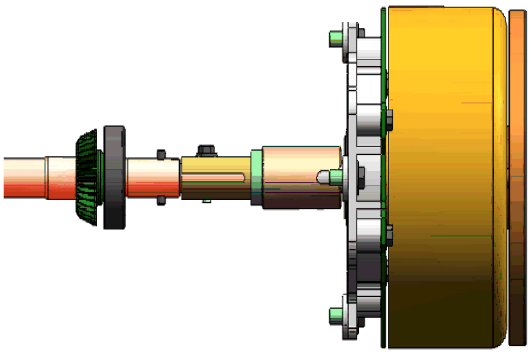
1.	Drum Cleaning Motors x4*[1]
2.	Development Motors x4*[1]
3.	Drum Motors x4
4.	Development Coil Shaft
5.	Drum Cleaning Motor Shaft
6.	Drum Motor Shaft
7.	Development Roller
*[1]: New items	

Changes to Improve Torque Transmission Efficiency

The size of color registration errors has been reduced with changes in the design of the drum motor.

Drum Motor Shaft

B132/B200



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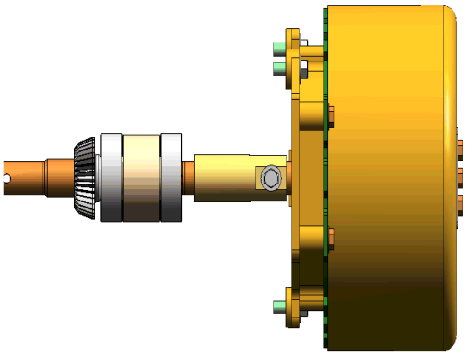
D014/D015

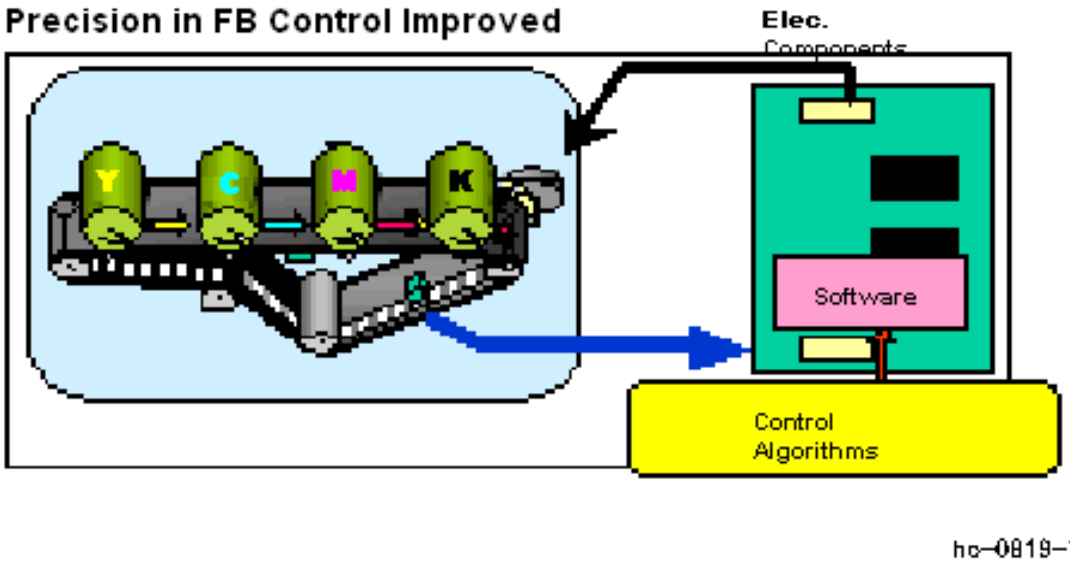


ho-0819-6

In the B132/B200, the drum motor shaft and drum motor are separate components. In the new D014/D015 drum motor, however, the shaft and motor are permanently connected. This direct-drive arrangement improves the performance of the drum motor and shaft. Also, for the D014/D015 drum motor, the rotation wave fluctuation of has been reduced by 30%.

In addition to this change in drum motor design, the FB (Feedback) control system has been improved to reduce color registration errors.

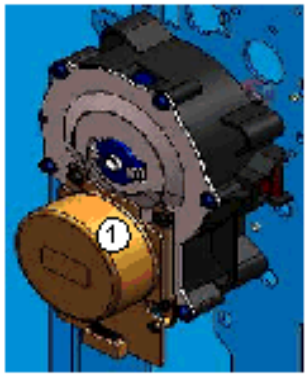
FB Control



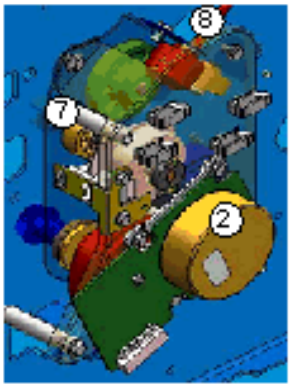
hc-0819-7

The average incidence of color registration errors on the ITB has been reduced. This has been achieved by improvement in the hardware (FB electrical components) and software (control algorithms).

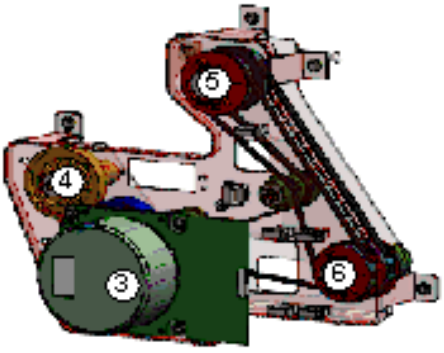
ITB Drive, PTR, Fusing/Exit Motors



hc-200c



hc-200d

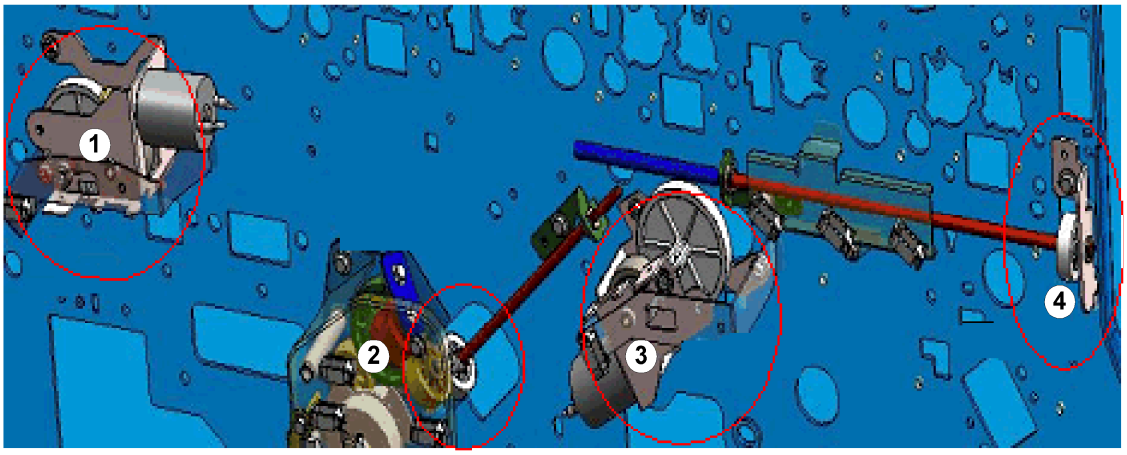


hc-200e

6hc-mtr2

①	ITB Drive Motor
②	PTR Motor
③	Fusing/Exit Motor
④	Paper Transport Belt Drive Shaft
⑤	Fusing Unit Drive Shaft
⑥	Duplex Unit Drive Shaft
⑦	ITB Cleaning Unit Drive Shaft
⑧	Used Toner Drive Shaft

K/YMC Lift, Used Toner Motors



ho-200f
6ho-mtr3

①	Black ITB Roller Lift Motor*1
②	Diagonal Used Toner Coil Motor
③	ITB Lift Motor
④	Horizontal Used Toner Coil

*1: New item: Lowers the black image transfer roller away from the ITB and PCU drum during automatic developer installation. **Not used at this time (Oct. 2007).**

Controller Board

- The number of board slots has been reduced to three.
- The number of SD card slots has been reduced to two. (A system SD card is no longer required. The system firmware resides on the controller board.)
- A new fan has been added to the GW controller board.

Small Changes

This is a quick summary of small changes in the D014/D015.

- **Filter Box Cover**. There are new filter boxes on the back of the machine. There are now three filter boxes.
- **Paper Tray Handles**. A new tray handle design has been adopted for the D014/D015. Also, the shape and operation of the end fence has changed.
- **Motherboard**. There is no motherboard in the D014/D015
- **Breaker Switch**. This machine does not have a breaker switch that requires testing at installation.
- **Peltier Unit**. The Peltier unit has been removed. The D014/D015 does not have a Peltier unit.
- **Paper Feed Unit**. A mylar has been added to facilitate feeding thicker paper.
- **Bypass Tray**. The operation of the side fences is much smoother.
- **Process Control**. The number of steps in process control has been reduced. Also, MUSIC processing and process control adjustment are executed at the same time at power on, so that the machine enters standby mode within a shorter length of time.
- **Fans**. Fans and ducts have been added on the faceplate that covers the toner supply unit. This new arrangement keeps the temperature lower. (The new PxP toner has a much lower melting point.)
- **Functions disabled during warm-up**. These functions have been disabled during warm-up:
    1. SP3820 (Manual Procon)
    2. Auto Color Calilbration (User Tools)
    3. Color Registration (User Tools)

Notes About Servicing

These are notes about the differences in servicing the D014/D015 machine. These changes are described in detail in Section 3.

1. Toner/developer and drum replacement.

The STCs of the B132/B200 and D014/D015 are not interchangeable. The D014/D015 uses the new PxP toner and the developer bottle has a new design. The B132/B200 STCs cannot be inserted in the D014/D015. The OPC drums of the B132/B200 and D014/D015 are also not interchangeable.

2. Scanner Unit.

The shapes and sizes of some of the scanner unit boards have changed to make them easier to service. Also, the arrangement of the APS sensors has been changed. The fan has been removed from the left side of the scanner unit.

3. Laser Unit.

The SP codes for the laser unit (provided on a decal attached to the laser unit) have changed. Also, the polygon motor harness connector has been modified.

4. PCU

- The OPC and development unit must be separated for servicing.
- The K and YMC PCUs are not the same. The K unit uses a charge corona unit and the YMC units use charge rollers to charge the OPC drum.
- The charge roller and cleaning roller are much easier to remove.
- The PCU stand (stored under the machine) is still required for servicing. The bottom of the D014/D015 PCU stand stores only one jig (required for developer replacement).
- The PCU stand is required for servicing, because it provides two important functions: 1) It protects the drum from damage and exposure to light while the PCU is out of the machine, and 2) It keeps the OPC aligned correctly so the development unit can be reattached.
- The PCU stand must remain attached to the bottom of the main machine at the customer site.

  - The shape of the D014/D015 PCU stand is not the same as the B132/B200 stand, so these stands are not interchangeable. Using the B132/B200 PCU stand with a D014/D015 PCU could damage the drum.
- The cleaning blades of the K PCU and YCM PCUs are not identical. One blade is designed for use with the K PCU and another type for the YCM PCUs. Each blade is marked "K" or "MCY" to identify the blade type.
- The lubricant bar of the K PCU and YCM PCU are identical. However, the lubricant bar “units” are not the same. The K PCU is marked with a "K" to

distinguish it from a YMC lubricant bar unit which is not marked. (The lubricant bar itself, however, can be used in either unit.)

- A D014/D015 PCU consists of both the drum unit and the development unit. However, unlike a B132/B200 PCU unit that could be opened, with the D014/D015 the drum unit and development unit must be separated for servicing.
- Installation of a new PCU. This procedure has changed. More SP code settings are required. These SP codes are provided on a sheet with each new PCU unit.

Important

  - When you dust the surface of a new drum, use only Lubricant Powder B1329700 (specially designed for this machine). Do not use the yellow toner from this machine because it contains developer. The developer will damage the drum and ITB.
- Developer replacement. This is a new procedure. A jig stored on the bottom of the PCU stand is required to lock the development roller so that the old developer can be removed from the PCU.
- The rectangular developer packs of the B132/B200 have been replaced with newly designed bottles.
- Filling and replacing developer: These are new procedures.
- TD sensor. The TD sensor is of new design and extremely sensitive (calibrated at the factory). This TD sensor cannot be replaced separately.

5. ITB unit

There are some minor changes in the servicing of the ITB unit. One connector has been removed, and the shapes of some parts have changed. The new ITB unit has two cleaning blades. Both blades are PM parts.

Important

- When you dust the surface of a new ITB, use only Lubricant Powder B1329700 (specially designed for this machine). Do not use the yellow toner from this machine, because it contains developer, and this will damage the drum and ITB.

6. PTR Unit

The PTR unit has a new lift mechanism and the lubrication bar is much easier to remove. Removing dust from the PTR unit is also much easier.

7. Fusing Unit. The fusing unit is new.

- There is a new lock arm at the back of the unit that must be released before the fusing unit can be removed. Disassembly of the fusing unit is much easier. **Important**: There are two fusing units: a 120V unit and 240 V unit.
- The fusing lamp connectors of the 120V unit are BLUE, those of the 240V unit are PINK.
- If the wrong type of fusing unit is installed in the machine, the machine will detect this and issue a warning. There is no danger of damaging either the fusing unit or main machine.
- The B132/B200 and D014/D015 fusing belts are not interchangeable. The D014/D015 belt is longer.

8. Boards. The layout of the main boards has changed.

- There is no motherboard.
- The AC boards of the 120V and 240V machines are different. The boards are clearly marked "100V" or "200V" in the center of the board to prevent installing the wrong type of board.
- The controller board must be removed before the IPU/VBCU boards can be removed.

9. HDD Removal

The HDD must be reconnected correctly. If the HDD is connected incorrectly, the machine will issue an HDD error at power on. This will not harm the HDD or corrupt data on the disk. Just power the machine off and reconnect the HDD correctly.

10. Motors

- Drum motor replacement is much easier (a jig is no longer required to lock the motor shaft.)
- The development motor and drum cleaning motor can be removed separately.
- The position of the paper transfer motor has changed.
- The shape of the image transfer motor has changed.

Detailed Summary of Changes

External Appearance, Operation Panel

- The operation panel includes a WVGA (Wide Video Graphic Array) Color Touch-Panel
- External covers and paper trays are newly designed. Paper trays adopt a new design.

Controller Box

- New design. Layout of internal components and PCBs has been changed.
- Also, an FCU (Fax Control Unit) is a new option.

Main Frame Configuration, Ventilation

- New cooling fans for the development units, and a new cooling fan near the Y PCU on the left side of the machine.
- A heat sink (in the form of a pipe) has been added to the fusing unit to improve efficiency of cooling.

Engine Drive Mechanisms

- PTR motor. A reduction gear has been added to the DD (Direct Drive) motor and transfer belt cleaning has been improved.
- The ITB encoder sensor (FB or Feedback sensors), two separate sensors on the B132/B200, have been combined into one sensor to reduce cost and improve efficiency.
- The used toner horizontal transport path has been extended.
- Along with changes in component layout around the drum, new drum cleaning motors have been added. Each drum cleaning roller is now driven by a separate motor.
- The linkage of the OPC drum motors has been improved in order to shorten warm-up time and to improve the precision of drum rotation.
- The design of the output drive shaft used in each development unit has been changed to reduce wear on the development unit gears.
- The drum potential sensors (x4) have been removed from the PCUs and mounted in the main machine, one above each PCU.

Exposure

- Along with improvement in the line speed, the CCD, exposure lamp, scanner motor have been modified.
- In order to reduce costs, newly designed lenses and an ADF exposure glass have been adopted for this machine.

Laser Writing

- In line with the improvement in the line speed, the speed of the polygon motor has been increased. (This follows similar improvement in other machines.)

Paper Feed

- In response to requests for better handling of thick paper, some changes have been done within the restricted range of the present B132/B200 layout.
- Some minor changes have been done in the paper feed trays (developed based on B132/B200) to allow feeding thicker paper.
- There are no changes in paper registration.
- Some small changes have been done within the limitations of the present design of the duplex/inverter unit for better handling of thicker paper and for reduction of paper curl.

Development, Toner Supply

- Adoption of high-resolution oil-less polyester polymerization toner (hereafter "PxP toner").
- A new STC (Soft Toner Cartridge) that contains toner pre-mixed with 10 wt% carrier is used to fill the development units.
- A new single-direction development method has been devised to reduce uneven image density on a single page and reduce developer deterioration.
- In order to improve the precision of heat reduction, an aluminum steel sleeve has been adopted. Also, Vs/Vp have been reduced to correct blurring at the trailing edges of solid images
- Automatic developer installation.

Drum Charge, Cleaning

The following measures have been adopted to deal with the problems of blade service life and dirty OPC drums, caused by the slippage of PxP toner on the ITB:

- The K PCU uses the Scorotron Charge Method that uses a self-cleaning charge corona wire, and an auxiliary cleaning brush.
- The other PCUs (Y,M,C) use charge rollers with retractable cleaning rollers and auxiliary cleaning brushes.

Image Transfer

The following measures have been adopted to deal with the problems of blade service life and dirty OPC drums, caused by the slippage of PxP toners on the ITB:

- A lubrication brush roller and lubricant counter blade (both for ZnSt) have been added downstream of the counter blade and brush system of the B132/B200 ITB cleaning system.

Paper Transfer

- Reducing the amount of toner in order to deal with the problem of the short service life of the cleaning blade, caused by the slippage of PxP toners on the ITB.
- Reverse bias is applied in the intervals between sheets on the ITB.
- A new lift device has been designed to raise and lower the PTR (raise it during paper transfer and lower it away from the ITB and bias roller when the machine is idle).

Fusing

- The fusing unit employs a halogen-belt design (halogen fusing lamps with fusing belt) in order to shorten the warm-up time to less than 75 to 90 sec.
- The fusing unit employs a sponge hot roller designed for a higher line speed and better grip at the nip, and also employs a new pressure roller mechanism that keeps the pressure roller separated from the hot roller when the machine is idle (this prevents warping of the soft sponge of the hot roller).
- The effect of the paper pointing downward as it exits the nip between the hot roller and pressure roller improves separation and reduces the streaking on the copies.

Process Control

- The length of time to complete process control is much shorter.
- The number of ID sensor patterns has been reduced.
- The precision of the TD sensor has been improved.

OPC Drums

- Adoption of the charge corona system for the K PCU improves resistance to nitrogen oxides (NOx) in the air.

Toner

- The new PxP toner used in the machine has a lower melting point. This allows a shorter warm-up time, reduces the amount of heat required for fusing, and achieves more even density in images.

SPECIFICATIONS

SPECIFICATIONS

Specifications

Main Frame D014/D015

Copying

Configuration	Console		
Dimensions (w x d x h)			
No ARDF	750 x 850 x 1050 mm (29.5 x 33.5 x 41.3 in.)		
With ARDF	750 x 850 x 1230 mm (29.5 x 33.5 x 48.4 in.)		
Weight (with ARDF)	Less than 298 kg (655.6 lb)		
Original Scanning	Flatbed with moving 3-line CCD array, image scanning		
Copy Process	4-drum dry electrostatic transfer system with internal transfer belt		
ARDF	Standard		
Development	Dry dual-component magnetic brush development		
Fusing	Oil-less belt fusing system		
Engine speed	D014	FC 55 cpm, BK 60 cpm	
	D015	FC 70 cpm BK 75 cpm	
Warm-up time	EU/AP	Less than 75 sec.	
	NA	D014: Less than 90 sec. D015: Less than 75 sec.	
First copy time	FC	D014/D015: Less than 7.5/6.4 sec.	
	BK	D014/D015: Less than 5.7/4.9 sec.	
Original types	Sheet, book, object		
Max. original size	A3, 11" x 17"		
Resolution	Copy	600 dpi 4-bit	
	Print	600 dpi 4-bit	
	Scan (Send)	600 dpi 8-bit	
Image Size	Default	297 (+4) x 457 mm (Note 1)	

	Max.	297 (+4) x 600 mm (Note 2)

Note 1: Size depends on the D014/D015 application "+4" not guaranteed.
Note 2:

- Size depends on the D014/D015 application "+4" not guaranteed.
- Setting with SP mode is required.
- The max. setting cannot be selected if the SR5000 is installed.

Magnification	NA	7 Reduction, 5 Enlargement: 93%, 85%, 78%, 73%, 65%, 50%, 25%,121%, 129%, 155%, 200%, 400%	
	EU/AP	7 Reduction, 5 Enlargement: 93%, 82%, 75%, 71%, 65%, 50%, 25%, 115%, 122%, 141%, 200%, 400%	
Zoom	25% to 400%		
Paper capacity (Number of sheets calculated with 80 g/m^2 20 lb bond paper)	Tray 1	1,100 x2	2,200
	Tray 2	550	550
	Tray 3	550	550
	Bypass	100	100
	Copier Capacity		**3,400**
	With LCIT	4,000	**7,400**
Original size detection: exposure glass	NA	11" x 17", 8½" x 14" SEF, 8½" x 11" LEF/SEF	
	EU/AP	A3/A4 SEF, B4 SEF, A4/B5 LEF/SEF, 8½ " x 13" SEF (8K, 16K available with SP mode)	
Original size detection (ARDF)	NA	11" x 17", 10" x 14", 8½ x 14" SEF 8½" x 11", 5½" x 8½" SEF/LEF 7¼" x 10½", A3 SEF A4 SEF/LEF	
	EU, Asia	A3, B4 SEF A4, B5, A5, B6 SEF/LEF 8½" x 13", 8K SEF 16K SEF	

Paper weight	Tray 1	52.3 – 216 g/m^2 14 Bond– 80 lb Cover
	Tray 2	52.3 – 216 g/m^2 14 Bond– 80 lb Cover
	Tray 3	52.3 – 216 g/m^2 14 Bond– 80 lb Cover
	Bypass	52.3 – 300 g/m^2 14 lb Bond– 110 lb Cover
	Duplex mode	64 – 163 g/m2 17 lb Bond – 90 lb Index
Output capacity	500 sheet (A4, 8½" x 11") (with copy tray)	
Power	NA	D014: 120V 60 Hz 20A D015: 208 to 240V 50 60 Hz 10A
	EU/AP	D014: 220V to 240V 50-60 Hz 10A
Max. power consumption	NA	Less than 1920 W
	EU/AP	Less than 2400 W
Counter	NA	Electric counter, mechanical counter x2
	EU/AP	Electric counter, mechanical counter x1
Counterfeit prevention	Bill recognition, invisible marking function	

Printing

CPU		Intel Pentium – M 1.46 GHz	
RAM		1536 MB (shared with copying, scanning)	
HDD		320 GB (160 GB x 2)	
PDL		RPCS, PCL5c, PCL6	
Print Resolution (max.)		600 x 600 dpi (4-bit)	
Fonts		Standard	48 PCL fonts
		Option	With PS3, 136 Adobe PostScript Type 1 fonts
Connectivity			
	Host interface	Standard	Ethernet RJ-45, 10-BaseT, 100BaseTX, USB 2.0
		Options*1	IEEE1284 ECP, IEEE1394 (FireWire), IEEE802.11b (Wireless LAN), Bluetooth
	Network Protocol		TCP IP, IPX/SPX, SMB (NetBEUI*2, NetBIOS over TCP/IP), AppleTalk (auto switching)
	MIB support	Private MIB	Ricoh original
		Standard MIB	MIB-II (RFC1213), HostResource (RFC1514), PrinterMib (RFC1759)
	Network, operating systems		Windows 95, 98SE, NT 4.0, 2000, Me, XP, Server 2003 NetWare 3.12, 3.2, 4.1, 4.11, 5.0, 5.1, 6 Unix, Sun Solaris, HP-UX, SCO Open Server, Red Hat Linux, IBM AIX, Mac OS 8.6 to 9.2x, OS X 10.1 or later

*1: Only 1 option can be installed at a time.
*2: Smart Device Monitor for Client is necessary for NetBEUI.

Scanning

Optical resolution	100, 150, 200 (default), 300, 400, 600 dpi		
Scanning speed	TBA		
Max. scan area	297 x 432 mm (11.7" x 17")		
Auto scan size detection	Exposure glass	Supported (conforms with copier specifications)	
	ARDF	Supported (conforms with copier specifications)	
Original size	Standard	A3, A4 SEF, A4 LEF, A5 SEF/LEF, B4, B5 SEF, B5 LEF, 11" x 17" SEF, 8½" x 14" SEF, 8½" x 13" SEF, 8½" x 11" SEF/LEF, 5½ " x 8½" SEF/LEF	
	Customized	Min.	10 x 10 mm (0.04" x 0.04")
		Max.	297 x 432 mm (11.7" x 17")
Compression Method	BW Binary: TIFF MH, MR, MMR Grayscale/Full Color: JPEG		
Interface support	10/100BaseTX, IEEE802.11b (Wireless LAN), IEEE1394 (FireWire)		
Scan mod	Default	BW Text	
	Supported	BW OCR, BW Text-Photo, BW Photo, Grayscale, FC Photo, FC Text Photo	
	Options*1	Auto Color Selection, sRGB Photo, sRGB Text Photo	

Image Density	Auto Density Selection, Manual Setting (7 levels)
Image Rotation	TBA
SADF/Batch mode	Supported
Mixed size originals	Supported

*1: File Format Converter D377 is necessary.

Original Feed: ARDF B652

Dimensions (w x d x h)	680 x 560 x 180 mm (26.8 x 22 x 7.1 in.)	
Weight	Less than 19.5 kg (42.9 lb)	
Power consumption	Less than 59 W	
Noise	Less than 71 db	
Stack capacity	100 sheets	
Original size	Simplex	A3, A4, A5, B5, B6 5½" x 8½", 8½" x 11", 8½" x 14", 11" x 17"
	Duplex	A3, A4, A5, B4, B5 5½" x 8½", 8½" x 11", 8½" x 14", 11" x 17"
Original weight	Simplex	40 – 128 g/m2 11 – 34 lb bond
	Duplex	52 – 128 g/m2 14 – 34 lb bond
Auto Original Size Detection	NA	11" x 17", 10" x 14", 8½ x 14" SEF 8½" x 11", 5½" x 8½" SEF/LEF 7¼" x 10½", A3 SEF A4 SEF/LEF
	EU, Asia	A3, B4 SEF A4, B5, A5, B6 SEF/LEF 8½" x 13", 8K SEF 16K SEF
Original set position	Face-up, left-rear corner	
Special original setting	Batch, mixed sizes	
Feeding speed	Full color	60 cpm
	Black	75 cpm
Power source	From copier	

Optional Peripherals

LCT B473

Installation of the LCT Adapter B699 is required to adjust the height of LCT B473.

Dimension (w x d x h)	Stand-alone	314 x 458 x 659 mm (12.4 x 18 x 25.9 in.)
	With LG/B4 Option	462 x 458 x 659 mm (18.2 x 18 x 25.9 in.)
Weight	Standalone	Less than 20 kg (44 lb)
	With LG/B4 Option	Less than 27 kg (59.4 lb)
Power Consumption		Less than 50 W
Noise		Less than 74dB
Paper Size		A4, B5, 11"x 8½" LEF
Paper Weight		52 - 128g/m^2 14 lb – 34 lb Bond
Paper Capacity (80 g/m^2 or 20 lb bond)		4,000 sheets** 2,500 sheets*

LCT 4000 D350

Expected Service Life	5 Years or 9,000K
Paper Feed System:	FRR-CF
Paper Capacity	2,000 sheets (Paper thickness: 0.11 mm)
Remaining Paper Detection (Accuracy: ±30 sheets)	5-Step including Near-End
Paper Weight	52 to 300 g/m^2
Paper Size	A5 to A3, HLT to 12 x 19.2 in. Postcards (100 mm wide) Custom Size: Length: 139.7 to 482.7 mm Custom Size: Width: 100 mm to 330.2 mm (Small Size: 100 to 139.2 mm)
Paper Size Switching	Side fence, end fence adjustment.
Paper Size Detection	Automatic
Anti-Condensation Heater	Available as option
Dimensions (w x d h)	865 x 730 x 746 mm (34 x 28.7 x 29.4 in.)
Weight	Less than 86 kg (190 lb)
Power Source	DC 24 V ±10% (from copier)
Power Consumption:	Less than 120 W
I/F	Serial
Tab Sheet:	Requires installation of tab sheet fence. **Note**: Only A4 LEF, 8½" x 11" LEF tab sheets can be fed.

8½ x 14" Paper Size Tray B474

This option converts LCT B473 so it can hold and feed LG size paper.

Paper Size	8 1/2"x14", 8½"x11", A4, B4 SEF
Paper Weight	52 - 128g/m^2 14 lb – 34 lb Bond

9-Bin Mailbox B762

- The mailbox can be installed on top of the 2000-Sheet Finisher D373 or the 3000-Sheet Finisher D374 (not 3000-Sheet Finisher B830).
- The mail box must be removed to install Cover Interposer Tray B704. The mail box and cover interposer tray cannot be installed at the same time.

Dimension (w x d x h)	540 x 600 x 660 mm (21.3 x 23.6 x 26 in.)
Weight	Less than 15 kg (33 lb)
Power Consumption	Less than 48 W
Noise	Less than 74 dB
Number of Bins	9 bins
Stack Capacity of each Bin	100 sheets*
Paper Size	A5. A4, A3 5½" x 8½", 8½" x11", 8½" x14", 11"x17"
Paper Weight	52 - 128g/m^2 14 lb – 34 lb Bond

Cover Interposer Tray B704

- Cover Interposer Tray B704 can be used with the 2000-Sheet Finisher D373 or 3000-Sheet Finisher D374 between the mainframe and finisher. The interposer tray and the Mailbox B762 cannot be installed together.
- This tray cannot be installed on the 3000-Sheet Finisher B830.

Dimension (w x d x h)		500 x 600 x 600 mm (19.7 x 23.6 x 23.6 in.)
Weight		Less than 12 Kg (26.4 lb)
Power Consumption		Less than 43 W
Noise		Less than 65 db
Stack Capability*		200 Sheets
Paper Size		A5-A3, 5½" x 8½" - 11" x 17"
Paper Weight		64 g/m^2-216 g/m^2 17 lb Bond- 58 lb Index, 80 lb Cover
Original Set Position		Center
Original Set	Normal Feed	Face-up
	Booklet Feed	Face-down

Cover Interposer Tray B835

Cover Interposer Tray B835 can be used only with the 3000-Sheet Finisher B830. It cannot be installed on the 2000/3000-Sheet Finishers D373/D374.

Speed	B234 (90 cpm)	432 mm/s	
	B235 (110 cpm)	515 mm/s	
	B236 (135 cpm)	649 mm/s	
Paper Separation	FRR System with Feed Belt		
Paper Sizes	Width: A5 SEF/5 1/2"x8½" SEF - 13" Length: A5 LEF/5 1/2"x8½" LEF - 19"		
Paper Weight	64 - 216 g/m^2		
Capacity	400 sheets (80 g/m^2) (2 trays 200 sheets each)		
Paper Size Detection	Yes		
Paper Size Switching	Operator adjustable side fences		
Side Registration	Yes		
Power Supply	24 V $\pm$ 5% (from mainframe)		
Power Consumption	Less than 50 W		
Dimensions (w x d x h)	Less than 540 x 730 x 1200 mm 21.2" x 28.7" x 47.2"		
Weight	Less than 45 kg (99 lb)		

3000-Sheet Finisher B830

This machine requires installation of the Finisher Adapter D375 in this finisher.

Finisher			
Dimension (w x d x h)		800 x 730 x 980 mm (31.5 x 28.7 x 38.6 in.)	
Weight		Less than 65 kg (143 lb)	
Power Consumption		Less than 100W	
Noise		Less than 75 dB	
Configuration		Console type attached base-unit with Finisher Adapter	
Power Source		From base-unit	
Proof Tray	Stack Capacity*	500 sheets	A4, 8½" x 11" or smaller
		250 sheets	B4, 8½" x 14" or larger
	Paper Size	A6 SEF-A3 SEF 5½ " x8½ " - 11"x17"	
	Paper Weight	52 g/m²-216 g/m² 14 lb Bond- 68 lb Bond / 140 lb Index / 90 lb Cover	
Shift Tray	Stack Capacity*	3000 sheets	A4 LEF, B5 LEF, 8½"x11" LEF
		1500 sheets	A3, A4, B4, B5 SEF 11"x17", 8½"x14", 8½" x 11" SEF
		500 sheets	A5 LEF, 5½"x8½" LEF
		100 sheets	A5 SEF, 5½"x8½" SEF
	Paper Size	A5 - A3 SEF 5½"x8½", 11"x17", 12"x18", 13"x19"	
	Paper Weight	52 g/m²-300 g/m² 14 lb Bond- 68 lb Bond / 140 lb Index / 90 lb Cover	

Staples	
Paper Size	B5-A3, 8 1/2"x11"-11"x17"
Paper Weight	64 g/m²-84 g/m², 17 lb Bond-20 lb Bond
Staple Position	Top, Bottom, 2 Staple, Top-slant
Staple Replenishment	Cartridge exchange / 5000 pins per cartridge

Stack Capacity with Stapler								
		Paper Size		Pages/Set		Sets		
		A4, B5 8½"x11"		10-100 pages		200-30 sets		
				2-9 pages		150 sets		
		A3, B4, 11" x 17", 8½" x 14"		10-50 pages		150-30 sets		
				2-9 pages		150 sets		

Punch Unit B831

This punch unit is for the 3000-Sheet Finisher B830.

<table>
<tr><td colspan="2" rowspan="3">Punch Unit Types</td><td colspan="2">NA</td><td>2/3 holes</td></tr>
<tr><td colspan="2">EU</td><td>2/4 holes</td></tr>
<tr><td colspan="2">Scandinavia</td><td>4 holes</td></tr>
<tr><td colspan="2" rowspan="2">Punch Waste Hopper Capacity</td><td colspan="2">NA 2/3 hole</td><td>10,000 sheets</td></tr>
<tr><td colspan="2">EU 2/4 hole</td><td>15,000 sheets</td></tr>
<tr><td colspan="2">Paper Weight</td><td colspan="3">52 g/m²-127.9 g/m²
14 lb Bond –34 lb Bond</td></tr>
<tr><td rowspan="10">Paper Size</td><td rowspan="2">NA 2-holes</td><td>SEF</td><td colspan="2">A6 - A3, 5½" x 8½" - 8½"x11"</td></tr>
<tr><td>LEF</td><td colspan="2">A5 - A4, 5½" x 8½", 8½"x11"</td></tr>
<tr><td rowspan="2">NA 3-holes</td><td>SEF</td><td colspan="2">A3, B4, 11"x17"</td></tr>
<tr><td>LEF</td><td colspan="2">A4, B5, 8½"x 11"</td></tr>
<tr><td rowspan="2">EU 2-holes</td><td>SEF</td><td colspan="2">A6 - A3, 5½"x8½" - 11"x17"</td></tr>
<tr><td>LEF</td><td colspan="2">A5 - A4, 5½" x 8½", 8½" x 11"</td></tr>
<tr><td rowspan="2">EU 4-holes</td><td>SEF</td><td colspan="2">A3, B4, 11" x 17"</td></tr>
<tr><td>LEF</td><td colspan="2">A4, B5, 8½" x 11"</td></tr>
<tr><td rowspan="2">Scandinavia 4-holes</td><td>SEF</td><td colspan="2">B6 - A3, 5½" x 8½" - 11" x 17"</td></tr>
<tr><td>LEF</td><td colspan="2">A5 - A4, 5½" x 8½", 8½" x 11"</td></tr>
</table>

2000-Sheet Finisher D373

This finisher provides booklet as well as corner stapling. Equipped with two trays, the upper tray holds stapled and shifted copies, and the lower tray holds booklet stapled and folded copies.

Dimensions w x d x h		657 x 613 x 960 mm (25.9 x 24.1 x 37.8")	
Weight		Less than 63 kg (138.6 lb) (no punch unit) Less than 65 kg (143 lb) (with punch unit)	
Power Consumption		Less than 96 W	
Noise		Less than 75 db	
Configuration		Console type attached base-unit	
Power Source		From base-unit	
Proof Tray	Stack Capacity*	250 sheets A4, 8 1/2"x11" or smaller 50 sheets B4, 8 1/2"x14 or larger	
	Paper Size	A5-A3 SEF, A6 SEF, A6 LEF 5½" x8½" to11" x 17" SEF, 12"x18" SEF	
	Paper Weight	52 g/m²-163 g/m² 14 lb Bond- 43 lb Bond / 90 lb Index / 60 lb Cover	
Shift Tray	Stack Capacity*	2,000 sheets	A4 LEF, 8 1/2"x11" LEF
		1,000 sheets	A3 SEF, A4 SEF, B4 SEF, B5 11"x17" SEF, 8½" x14" SEF, 8½" x 11" SEF, 12"x18" SEF
		500 sheets	A5 LEF
		100 sheets	A5 SEF, B6 SEF, A6 SEF, 5½" x8½" SEF
	Paper Size	A5 - A3 SEF, A6 SEF, B6 SEF 5½" x8½" to 11" x 17" SEF, 12" x 18" SEF	
	Paper Weight	52 g/m²-256 g/m² 14 lb Bond- 68 lb Bond / 140 lb Index / 90 lb Cover	
Staple			
Paper Size		B5-A3, 8 1/2"x11"-11"x17", 12"x18"	
Paper Weight		64 g/m²-90 g/m², 17 lb Bond-28 lb Bond	
Staple Position		Top, Bottom, 2 Staple, Top-slant	
Staples Capacity*	Same Paper	50 sheets	A4, 8½" x 11" or smaller

<table>
<tr><td rowspan="3"></td><td colspan="2">Size</td><td>30 sheets</td><td>B4, 8½" x 14" or larger</td></tr>
<tr><td colspan="2">Mixed Paper Size</td><td>30 sheets</td><td>A4 LEF & A3 SEF, B5 LEF & B4 SEF, 8½"x11" LEF & 11" x17" SEF</td></tr>
<tr><td colspan="2">Booklet Stapling</td><td>15 sheets</td><td>A4 SEF, A3 SEF, B5 SEF, B4 SEF, 8 1/2"x11" SEF, 8 1/2"x14" SEF, 11"x17" SEF, 12"x18" SEF</td></tr>
<tr><td colspan="2" rowspan="2">Staple Replenishment</td><td colspan="2">Corner staple</td><td>5,000 staples per cartridge</td></tr>
<tr><td colspan="2">Booklet staple</td><td>2,000 staples per cartridge</td></tr>
<tr><td rowspan="9">Corner Staple Capacity</td><td rowspan="6">Same Size</td><td rowspan="2">A4 LEF, 8 1/2"x11" LEF</td><td>13-50 pages</td></tr>
<tr><td>2-12 pages</td></tr>
<tr><td rowspan="2">A4 SEF, B5, 8 /12"x11" SEF</td><td>10-50 pages</td></tr>
<tr><td>2-9 pages</td></tr>
<tr><td rowspan="2">Others</td><td>10-30 pages</td></tr>
<tr><td>2-9 pages</td></tr>
<tr><td>Mixed Size</td><td>A4 LEF + A3 SEF
B5 LEF + B4 SEF
8 1/2"x11" LEF + 11" x17" SEF</td><td>2-30 pages</td></tr>
<tr><td rowspan="3">Booklet Staple Capacity</td><td colspan="2" rowspan="3">A4 SEF, A3 SEF, B5 SEF, B4 SEF
8 1/2"x11" SEF, 8 1/2"x14" SEF, 11"x17" SEF
12"x18" SEF</td><td>2-5 pages</td></tr>
<tr><td>6-10 pages</td></tr>
<tr><td>11-15 pages</td></tr>
</table>

D373/D374 Paper Specifications

Paper Size	Plain Paper			Paper Type	
	Copier PPC	Used Paper	Recycled Paper	Colored Paper	Translucent Blueprint
A3 SEF	l	—	l	l	s
B4 SEF	l	s	l	l	s
A4 SEF	l	s	l	l	s
A4 LEF	'	s	'	'	s
B5 SEF	l	s	l	l	s
B5 LEF	'	s	'	'	s
A5 SEF	m	—	—	—	—
A5 LEF	m	—	—	—	—
B6 SEF	s	—	—	—	—
B6 LEF	s	—	—	—	—
12" x 18" SEF	l	—	l	l	—
11" x 17" SEF	l	—	l	l	s
8½" x 14"	l	—	l	l	s
8½" x 11" SEF	l	—	l	l	s
8½" x 11" LEF	'	—	'	'	s
5½" x 8½"	m	—	—	m	—
5½" x 8½"	m	—	—	m	—

'	Corner stapling, Shift, YES
l	Booklet stapling/folding, Shift, YES
m	Shift ONLY
s	Shift NO
—	Not available

3000-Sheet Finisher D374

This finisher provides corner stapling only.

Finisher			
Dimension (w x d x h)		657 x 613 x 960 mm	
Weight		Less than 54 kg Less than 56 kg with Punch Unit	
Power Consumption		Less than 96 W	
Noise		Less than 75 db	
Configuration		Console type attached base-unit	
Power Source		From base-unit	
Proof Tray	Stack Capacity*	250 sheets A4, 8 1/2"x11" or smaller 50 sheets B4, 8 1/2"x14 or larger	
	Paper Size	A5-A3 SEF, A6 SEF, A6 SEF 5 1/2"x8 1/2"-11"x17"SEF, 12"x18" SEF	
	Paper Weight	52 g/m²-163 g/m² 14 lb Bond- 43 lb Bond / 90 lb Index / 60 lb Cover	
Shift Tray	Stack Capacity*	3,000 sheets	A4 LEF, ½" x11" LEF "
		1,500 sheets	A3 SEF, A4 SEF, B4 SEF, B5, 11"x17" SEF, 8½" x14" SEF, 8½" x 11" SEF, 12"x18" SEF
		500 sheets	A5 LEF**
		100 sheets	A5 SEF, B6 SEF, A6 SEF, 5½" x 8½",SEF
	Paper Size	A5 - A3 SEF, A6 SEF, B6 SEF, 5½" x 8½"- 11"x17" SEF, 12" x 18" SEF	
	Paper Weight	52 g/m²-256 g/m² 14 lb Bond- 68 lb Bond / 140 lb Index / 90 lb Cover	
Staples			
Paper Size		B5-A3 8 1/2"x11"-11"x17", 12"x18"	
Paper Weight		64 g/m²-90 g/m² 17 lb Bond-28 lb Bond	
Staple Position		Top, Bottom, 2 Staple, Top-slant	
Stapling	Same Paper	50 sheets	A4, ½" x11" or smaller

<table>
<tr><td rowspan="2">Capacity</td><td>Size</td><td>30 sheets</td><td colspan="3">B4, ½" x14" or larger</td></tr>
<tr><td>Mixed Paper Size</td><td>30 sheets</td><td colspan="3">A4 LEF + A3 SEF,
B5 LEF + B4 SEF,
8½" x11" LEF + 11" x17" SEF</td></tr>
<tr><td colspan="2">Staple Replenishment</td><td colspan="4">Cartridge exchange / 5000 pins per cartridge</td></tr>
<tr><td rowspan="8">Stapled Stack Capacity (same size)</td><td colspan="2">Paper Size</td><td>Pages/Set</td><td>Sets</td></tr>
<tr><td colspan="2" rowspan="2">A4 LEF, 8 1/2"x11" LEF</td><td>20-50 pages</td><td>150-60 sets</td></tr>
<tr><td>2-19 pages</td><td>150 sets</td></tr>
<tr><td colspan="2" rowspan="2">A4 SEF, B5, 8 /12"x11" SEF</td><td>15-50 pages</td><td>100-30 sets</td></tr>
<tr><td>2-14 pages</td><td>100 sets</td></tr>
<tr><td colspan="2" rowspan="2">Others</td><td>15-30 pages</td><td>100-33 sets</td></tr>
<tr><td>2-14 pages</td><td>100 sets</td></tr>
<tr><td colspan="2">Stapled Stack Capacity (mixed sizes)</td><td>A4 LEF & A3 SEF, B5 LEF & B4 SEF, 8 1/2"x11" LEF & 11" x17" SEF</td><td>2-30 pages</td><td>50 set</td></tr>
</table>

Punch Unit B702

This punch unit is designed for use with the 2000-Sheet Stapler D373 (both corner and booklet stapling) and 3000-Sheet Stapler D374 (corner stapling only).

Available Punch Units		NA	2/3 hole switchable
		EU	2/4 holes switchable
		Scandinavia	4 holes
Punch Waste Replenishment		NA 2-hole	Up to 5,000 sheets
		NA 3-hole	Up to 5,000 sheets
		EU 2-hole	Up to 14,000 sheets
		EU 4-hole	Up to 7,000 sheets
		Scandinavia 4-hole	Up to 7,000 sheets
Paper Weight		52 g/m²-163 g/m², 14 lb Bond –43 lb Bond / 90 lb Index / 60 lb Cover	
Paper Sizes	NA 2-hole	SEF	A5 to A3, 5½" x 8½" to 11"x17"
		LEF	A5 - A4, 5½" x 8½", 8½" x 11"
	NA 3-hole	SEF	A3, B4, 11"x17"
		LEF	A4, B5, 8½" x 11"
	EU 2-hole	SEF	A5 - A3, 5½" x 8½" to 11" x 17"
		LEF	A5 to A4, 5½" x 8½", 8½" x 11"
	EU 4-hole	SEF	A3, B4, 11"x17"
		LEF	A4, B5, 8½" x 11"
	Scandinavia 4-hole	SEF	A5 to A3, 5½" x 8½" to 11" x 17"
		LEF	A5 - A4, 5½" x8½", 8½" x 11"

Z-Folding Unit ZF4000 B660

Paper Size		
No Folding (52-300 g/m^2)	A3, A4, A5, A6 SEF, B4, B5, B6 SEF 11" x 17", 81/2"x14", 81/2"x11" SEF, 51/2"x81/2", 12" x 18"	
Folding (64-80 g/m^2)	A3, B4, A4 SEF 11" x 17", 81/2"x14", 81/2"x11" SEF, 12" x 18"	
Dimensions (w x d x h)	177 x 620 x 960 mm 7 x 24.5 x 37.8 in.	
Weight	Less than 55 kg (121 lb)	
Power Consumption	100 W max.	
Power Supply	North America	120 V, 60 Hz, 1A
	Europe/Asia	220-240 V, 50/60 Hz, 0.5A

A3/11" x 17" Tray B331

This option is installed in Tray 1 (tandem tray) of the copier so that Tray 1 can feed larger paper. Tray 1 normally feeds LT or A4 only.

Dimension (w x d x h)	495 x 215 x 535 mm (19.5 x 8.5 x 21.1 in.)
Weight	11 kg (24.2 lb)
Paper Size	A3 SEF, B4 SEF, A4 11"x17" SEF, 8½" x 14" SEF, 8½" x 11"
Paper Capacity	1,000 Sheets

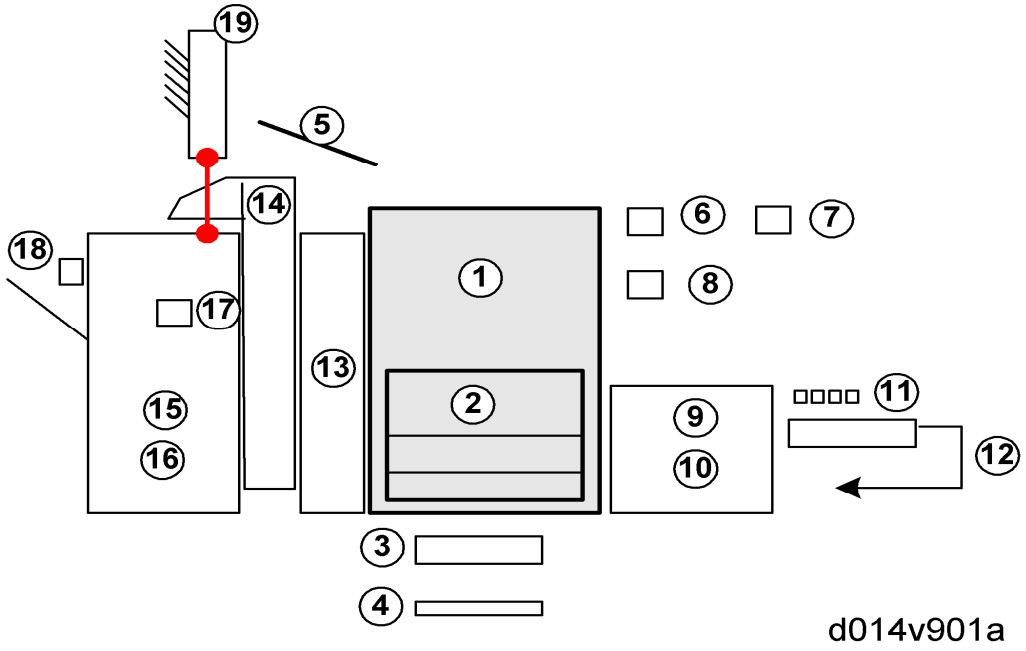
Copy Tray B476

The copy tray is installed receive copies when the copier is used without a finisher.

Dimension (w x d x h)	400 x 335 x 70 mm (15.8 x 13.2 x 2.8 in.)	
Weight	640 g (1.4 lb)	
Paper Capacity	500 Sheets	A4, 8½" x 11"
	250 Sheets	A3, 11"x 17"

Machine Configuration

Configuration 1 (with D373/D374 Finisher)

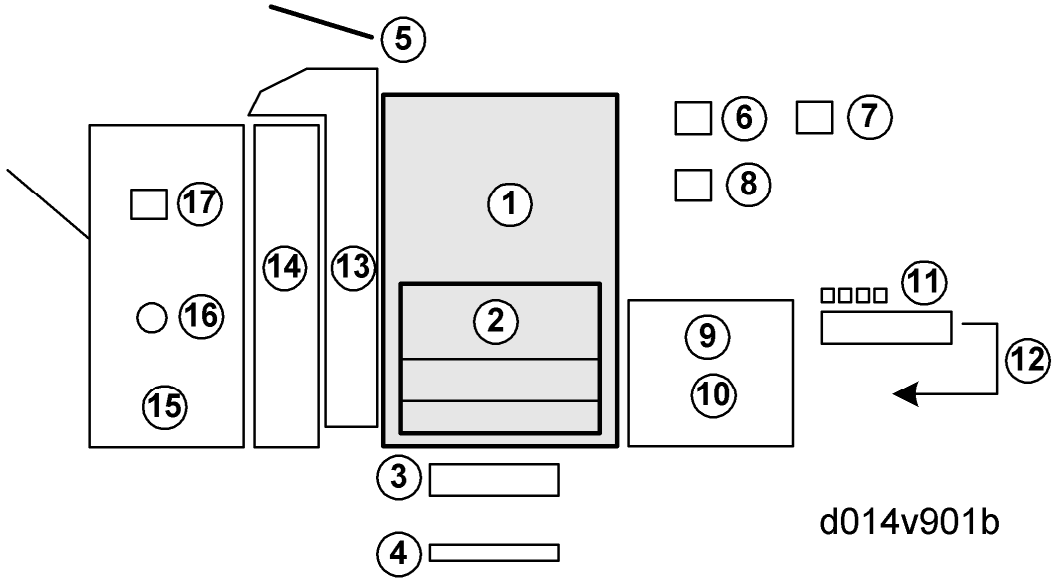


No.	Item	Comments
①	D014/D015a/b	Main unit
②	Tandem Tray	Built into main unit
③	A3/11"x17" Tray Type (B331)	Option for tandem tray
④	Tab Sheet Holder Type (B499)	Option for tandem tray
⑤	Copy Tray (B756)	For no finishers
⑥	Key Counter Bracket (B452)	Counter option
⑦	Key Counter Interface Unit Type (A) (B870)	Board required for key counter
⑧	Card Reader Bracket (B498)	Counter option
⑨	LCT 4000 (D350) *1	Only one of these options can be installed.
⑩	A4/LT LCT (B473)	

No.	Item	Comments
⑪	LCT Adapter (B699)	Required for LCT B473
⑫	LG Unit for A4/LT LCT (B474)	Option for LCT B473
⑬	Z-Folding Unit ZF4000 (B660) *1	
⑭	Cover Interposer Tray (B704)	For D373 (2000-sheet), D374 (3000-sheet) finishers only. Only 1 tray. Cannot be installed with Mail Box (B762).
⑮	Finisher SR4020 (D373) *1	2000-sheet finisher, 50 staple, Booklet folding and stapling
⑯	Finisher SR4010 (D374) *1	3000-sheet finisher, 50 staple, corner stapling only
⑰	Punch Unit (B702)	For either finisher D373 or D374
⑱	Output Jogger Unit (B703)	For either finisher D373 or D374
⑲	Mail Box CS391 (B762)	For D373 (2000-sheet), D374 (3000-sheet finishers only). Cannot be installed with Cover Interposer Tray (B704)

*1 New options for this machine.

Configuration 2 (with B830 Finisher)



No.	Item	Comments
①	D014/D015a/b	Main unit
②	Tandem Tray	Built into main unit
③	A3/11"x17" Tray Type (B331)	Option for tandem tray
④	Tab Sheet Holder Type (B499)	Option for tandem tray
⑤	Copy Tray (B756)	For no finishers
⑥	Key Counter Bracket (B452)	Counter option
⑦	Key Counter Interface Unit Type A (B870)	Board
⑧	Card Reader Bracket (B498)	Counter option
⑨	LCT 4000 (D350	Only one can be installed.
⑩	A4/LT LCT (B473)	
⑪	LCT Adapter (B699)	Required for LCT B473 to adjust height.
⑫	LG Unit for A4/LT LCT (B474)	Option for LCT B473
⑬	Cover Interposer Tray CI 5000 (B835)	Two source trays. Can be installed with

No.	Item	Comments
		3000-sheet finisher B830 only.
⑭	Z-Folding Unit ZF4000 (B660)	Can be installed with D373, D374, B830 finishers.
⑮	Finisher SR5000 (B830)	3000-Sheet finisher, 100 staples, jogger standard.
⑯	Finisher Adapter (D375)	For Finisher B830
⑰	Punch Unit PU 5000 (B831)	For 3000-sheet finisher B830 only.

Electrical Components

Copier

No.	Component	Function
COUNTERS		
TC1	Total Counter: FC	The mechanical counter for full color printing.
TC2	Total Counter: K	The mechanical counter for black-and-white printing.
HEATERS		
H1	Lower Tray Heater	Keeps paper dry. Provided with machine, connection is optional.
H2	Anti-condensation Heater – Scanner (Option)	Prevents the formation of condensation in the scanner unit.
H3	Anti-condensation Heater – Transfer	This options removes moisture from the air around the paper transfer unit.
H4	Upper Tray Heater	Keeps paper dry. Provided with machine, connection is optional.
HARD DISKS		
HDD1	Hard Disk Drives	The HDDs hold temporary files spooled for processing and also store permanent files for the document server application.
HDD2		2nd HDD in a set of 4.
HDD3		3rd HDD in a set of 4.
HDD4		4th HDD in a set of 4.

LAMPS		
L1	Exposure Lamp	Projects high intensity light on the original for exposure.
L2	Heating Roller Fusing Lamp 1	590W fusing lamp in the heating roller.
L3	Heating Roller Fusing Lamp 2	590W fusing lamp in the heating roller.
L4	Hot Roller Fusing Lamp	350W fusing lamp inside the hot roller.
L5	Pressure Roller Fusing Lamp	350W fusing lamp inside the pressure roller.
MOTORS		
M1	Scanner Motor	Drives the scanner unit
M2	Lower Relay Motor	Drives the lower relay roller of the relay unit at the vertical transport section.
M3	Paper Feed Motor: Tray 1	Drives the paper feed roller and grip roller of tray 1 (tandem tray).
M4	Paper Feed Motor: Tray 3	Drives the paper feed roller and grip roller of tray 3 (bottom tray).
M5	Paper Feed Motor: Tray 2	Drives the paper feed roller and grip roller of tray 2 (middle tray).
M6	Waste Toner Distribution Motor	Drives the coil that spans the top of the waste toner bottle.
M7	Lift Motor - Tray 2	Switches on and drives a shaft and coupling that raises a lift arm against the bottom plate under the paper stack in tray 2
M8	Lift Motor: Tray 3	Drives a shaft and coupling that raises a lift arm against the bottom plate under the paper stack in tray 3.
M9	Lift Motor: Tray 1	Drives pulleys and cables that lift the bottom plate of tray 1 (tandem tray) until the top of the paper stack reaches the correct height for feeding.
M10	Rear Fence Motor - Tray 1	Switches on when the right paper tray sensor of the tandem paper tray unit detects paper out and the left paper tray sensor detects paper present.
M11	ITB Lift Motor	Rotates the cam that raises and lowers the ITB belt.
M12	Ozone Fan Motor	Draws air from around the drums and through the ozone filter.

M13	Fusing Fan Motor	Cools the fusing unit.
M14	Fusing Cooling Fan Motor	Draws cool air into the fusing unit through a vent and past a heat sink mounted above the fusing unit.
M15	Fusing Exhaust Fan Motor	Draws the hot air away from the heat sink mounted above the fusing unit and expels the hot air through a vent
M16	Fusing/Exit Motor	Drives the fusing unit and paper exit.
M17	PTR Motor	Drives the paper transfer roller (PTR).
M18	Bypass Feed Motor	Drives the upper relay roller that feeds each sheet to the registration roller.
M19	Duplex Jogger Motor	Moves the jogger fences in the duplex unit.
M20	Duplex Unit Fan Motor	Cools the duplex unit.
M21	Duplex Transport Motor	Drives transport rollers 3, 4 in the duplex unit.
M22	Duplex Inverter Motor	Feeds paper to the jogger section.
M23	Registration Motor	Rotates the registration roller.

M24	Image Transfer Fan Motor	Cools the upper area of the transfer unit where the PCUs contact the ITB.
M25	Pipe Cooling Fan Motor	Pulls in air draws it over the fins attached to the front end of the heat pipe roller.
M26	Paper Transport Fan Motor - Rear	1 of 2 vacuum fans that produce suction to kepp paper on the transport belt.
M27	Paper Transport Fan Motor - Front	1 of 2 vacuum fans that produce suction to kepp paper on the transport belt.
M28	Paper Exit Fan Motor	Draws hot air from around the paper exit area and expels it from the left side of the machine.
M29	Front Duplex Fan Motor	Draws hot air out of the duplex unit.
M30	Rear Duplex Fan Motor	Draws hot air out of the duplex unit.
M31	ID Sensor Dust Fan Motor	Blows air around the ID sensors to prevent dust from collecting.
M32	Cooling Fan Motor	Draws air and sends it through a duct to the four PCU cooling fans.
M33	Circulation Fan Motor	Circulates air.
M34	Laser Unit Cooling Fan Motor - Front	Draws cool air into the machine.
M35	Laser Unit Cooing Fan Motor - Rear	Expels hot air from the machine on the left side.
M36	PCU Motor : M	Drives all the rollers in the Magenta PCU.
M37	PCU Motor: K	Drives all the rollers in the Black PCU.
M38	PCU Motor: Y	Drives all the rollers in the Yellow PCU.

M39	PCU Motor: C	Drives all the rollers in the Cyan PCU.
M40	Controller Box Exhaust Fan Motor 2	1 of 2 fans that cool the printed circuit boards at the back of the machine.
M41	Controller Box Exhaust Fan Motor 1	1 of 2 fans that cool the printed circuit boards at the back of the machine.
M42	Drum Motor: Y	Drives the drum in the Yellow PCU.
M43	Drum Motor: C	Drives the drum in the Cyan PCU.
M44	Drum Motor: M	Drives the drum in the Magenta PCU.
M45	Drum Motor: K	Drives the drum in the Black PCU.
M46	ITB Drive Motor	Rotates the image transfer roller that drives the ITB.
M47	3rd Mirror Motor - M	Fine adjusts the position of the 3rd mirror of the optics for M (magenta) during MUSIC adjustment.
M48	Polygon Mirror Motor	Rotates the polygon mirror in the laser optics unit
M49	3rd Mirror Motor - Y	Fine adjusts the position of the 3rd mirror of the optics for Y (Yellow) during MUSIC adjustment.
M50	3rd Mirror Motor - C	Fine adjusts the position of the 3rd mirror of the optics for C (Cyan) during MUSIC adjustment.
M51	Toner Hopper Motor	Drives the toner pump clutch and sub hopper clutch of each PCU.
M52	PCU Fan Motor: Y	Cools the Yellow PCU.
M53	PCU Fan Motor: C	Cools the Cyan PCU.
M54	PCU Fan Motor: M	Cools the Magenta PCU

M55	Scanner Unit Fan Motor - Rear Left	Cools the left, rear corner of the SIOB.
M56	Scanner Unit Fan Motor - Rear Center	Cools the rear, center area of the SIOB.
M57	Scanner Unit Fan Motor - Right	Exhausts warm air from the SIOB area.
M58	Waste Toner Collection Bottle Motor	Drives the waste toner bottle transport coil that moves the toner from the central collection point into the waste toner bottle.
MECHANICAL CLUTCHES		
MC1	Bypass Feed Clutch	Engages and operates the pick-up roller at the bypass feed tray.
MC2	Toner Pump Clutch: M	Engages the and drives the Magenta toner pump to pull toner from the Magenta STC.
MC3	Toner Supply Clutch: M	Engages the toner supply coils in the sub hopper of the Magenta PCU to send toner to the development unit below.
MC4	Toner Pump Clutch : K	Engages the and drives the Black toner pump to pull toner from the Black STC.
MC5	Toner Supply Clutch : K	Engages the toner supply coils in the sub hopper of the Black PCU to send toner to the development unit below.
MC6	Toner Pump Clutch: Y	Engages the drive shaft and rotor of the Yellow toner pump to pull toner from the Yellow STC when more toner is needed.

MC7	Toner Supply Clutch: Y	Engages the toner supply coils in the sub hopper of the Yellow PCU to send toner to the development unit below.
MC8	Toner Pump Clutch: C	Engages the and drives the Cyan toner pump to pull toner from the Cyan STC.
MC9	Toner Supply Clutch: C	Engages the toner supply coils in the sub hopper of the Cyan PCU to send toner to the development unit below.
PCBs		
PCB1	PFB (Paper Feed Board)	Controls paper trays and paper feed.
PCB2	AC Drive Board	Controls the power supply to the fusing lamps, heaters, and PSU.
PCB3	PSU (Power Supply Unit)	Supplies DC current to the machine and contains the AC drive that controls the fusing lamp power supply.
PCB4	DRB (Drive Board)	Contains the circuits for the stepping motors that drive the printer engine, and distributes electrical power to all other PCBs.
PCB5	Power Pack: Development Bias	Supplies the voltage for the bias applied to the developer in the PCUs by the development rollers.
PCB6	Power Pack: Charge	Supplies the voltage for the charge applied to the OPC drums by the charge roller.
PCB7	Power Pack: Transfer	Supplies charge to 1) the four image transfer rollers that pull the toner images from the four from the four drums (Y, M, C, K), and 2) to the paper transfer roller that pulls the image off the ITB onto paper.
PCB8	Power Pack - Separation	Supplies the dc/ac charges for paper separation.

PCB9	DTMB (Drum/Transfer Motor Board)	Controls the motors that drive the OPC drums and ITB.
PCB10	IPU	Performs: 1) Image processing control, 2) GW controller interface, 3) peripheral timing control.
PCB11	Potential Sensor Board	Processes data from the Y, M, C, K, potential sensors.
PCB12	CNB (Connector Board)	Sorts and routes signals to electrical components.
PCB13	IDCB: C1	One of two ID control boards at the base of the Cyan STC. The CPU reads the board to confirm that the correct STC is inserted into the correct bin.
PCB14	IDCB: M1	One of two ID control boards at the base of the Magenta STC. The CPU reads the board to confirm that the correct STC is inserted into the correct bin.
PCB15	IDCB: K1	One of two ID control boards at the base of the Black STC. The CPU reads the board to confirm that the correct STC is inserted into the correct bin.
PCB16	IDCB: Y1	One of two ID control boards at the base of the Yellow STC. The CPU reads the board to confirm that the correct STC is inserted into the correct bin.
PCB17	SBU (Sensor Board Unit)	Contains the CCD. Converts CCD analog signals to digital signals.
PCB18	SIOB (Scanner Interface Board)	Controls all the sensors in the scanner unit and controls the carriage drive stepping motors.
PCB19	Lamp Regulator	Converts the dc power input to a stable, high frequency ac output to the exposure lamp.

PCB20	VBCU	VBCU: 1) Engine sequence control (all sensors, motors, fusing temperature monitoring circuits), 2) Scanning control, 3) Exposure control, 3) Image processing control, 4) GW controller I/F, 5) Peripheral timing control. The I/O control board controls 1) Input/output ports for all sensors, motor, solenoids, 2) drivers, 3) high voltage power supply for PWM, and 4) analog input signals.
PCB21	LD 1 (2/2)	Laser Diode 1, 2nd of a pair, 1 of 8.
	LD 1 (1/2)	Laser Diode 1, 1st of a pair, 1 of 8.
PCB22	LD 2 (2/2)	Laser Diode 2, 2nd of a pair, 1 of 8.
	LD 2 (1/2)	Laser Diode 2, 1st of a pair, 1 of 8.
PCB23	LD 3 (2/2)	Laser Diode 3, 2nd of a pair, 1 of 8.
	LD 3 (1/2)	Laser Diode 3, 1st of a pair, 1 of 8.
PCB24	LD 4 (2/2)	Laser Diode 4, 2nd of a pair, 1 of 8.
	LD 4 (1/2)	Laser Diode 4, 1st of a pair, 1 of 8.
PCB25	LSDB: K Front	Front Laser Synchronization Detector Board for Laser Diode 4.
PCB26	LSDB: M Front	Front Laser Synchronization Detector Board for Laser Diode 3.
PCB27	LSDB: C Front	Front Laser Synchronization Detector Board for Laser Diode 2.
PCB28	LSDB: Y Front	Front Laser Synchronization Detector Board for Laser Diode 1.

PCB29	LSDB: Y Rear	Rear Laser Synchronization Detector Board for Laser Diode 1.
PCB30	LSDB: C Rear	Rear Laser Synchronization Detector Board for Laser Diode 2.
PCB31	LSDB: M Rear	Rear Laser Synchronization Detector Board for Laser Diode 3.
PCB32	LSDB: K Rear	Rear Laser Synchronization Detector Board for Laser Diode 4.
PCB33	Controller Board	Incorporates the GW architecture, and connects to the BICU and PCI I/F. All the options for the printer are controlled by this board.
PCB34	Mother Board	Interfaces the controller and the BICU.
PCB35	RAPI EXT Board	Interface the copy connector and EFI controller.
PCB36	OPU (Operation Panel Unit)	Controls the operation panel.
PCB37	PI Board	Interfaces the IPU and RDS.
QUENCHING LAMPS		
QL1	Quenching Lamp : K	Eliminates electrical charge and neutralizes the surface of the drum in the Black PCU.
QL2	Quenching Lamp: C	Eliminates electrical charge and neutralizes the surface of the drum in the Cyan PCU.
QL3	Quenching Lamp: M	Eliminates electrical charge and neutralizes the surface of the drum in the Magenta PCU.
QL4	Quenching Lamp: Y	Eliminates electrical charge and neutralizes the surface of the drum in the Yellow PCU.

SENSORS		
S1	ID Sensor: Black	Reads 1) light reflected from the bare surface of the ITB, and 2) reads light reflected from the black ID sensor patterns on the ITB.
S2	ID Sensor: Color	Reads 1) light reflected from the bare surface of the ITB, and 2) reads light reflected from the color ID sensor patterns on the ITB. This sensor has one additional receptor to collect diffuse light reflected from color toner to improve calculation of the toner density.
S3	ITB Lift Sensor	This sensor switches the ITB lift motor off when the ITB comes into contact the drums of the four PCUs.
S4	MUSIC Sensor: Center	Reads the center MUSIC pattern. This feedback is used to control the MUSIC process to correct color registration errors.
S5	MUSIC Sensor: Front	Reads the front MUSIC pattern. This feedback is used to control the MUSIC process to correct color registration errors.
S6	MUSIC Sensor: Rear	Reads the Rear MUSIC pattern. This feedback is used to control the MUSIC process to correct color registration errors.
S7	Paper Feed Sensor: Tray 2	Detects the leading edge of each sheet of paper from the pick–up roller of tray (middle tray) and switches off the pick–up roller solenoid so the pick–up roller lifts.
S8	Vertical Transport Sensor: Tray 2	Detects the leading edge and trailing edge of each sheet fed from tray 2 and signals a jam if the edges do not pass at the prescribed time.

S9	Paper End Sensor: Tray 2	Receives light reflected from the paper until the last sheet is fed from tray 2 (middle tray), then signals paper end.
S10	Lift Sensor: Tray 2	Detects when the pick–up roller (pushed up by the top of the paper stack in the right side of the tandem tray) has reached the correct height for paper feed and then switches off the tray 2 (middle tray) lift motor.
S11	Paper Feed Sensor: Tray 3	Detects the leading edge of each sheet of paper from the pick–up roller of tray 3 (bottom tray) and switches off the pick–up roller solenoid so the pick–up roller lifts.
S12	Vertical Transport Sensor: Tray 3	Detects the leading edge and trailing edge of each sheet fed from tray 3 and signals a jam if the edges do not pass at the prescribed time.
S13	Paper End Sensor: Tray 3	Receives light reflected from the paper until the last sheet is fed from tray 3 (bottom tray), then signals paper end.
S14	Lift Sensor: Tray 3	Detects when the pick–up roller (pushed up by the top of the paper stack in the right side of the tandem tray) has reached the correct height for paper feed and then switches off the tray 3 (bottom tray) lift motor.
S15	Bottom Temperature/Humidity Sensor	Near the waste toner bottle. Detects ambient temperature and humidity and then this output is used to control the amount of current applied to the paper transfer roller and ITB when the image is transferred to paper. Also used to correct the fusing temperature, and to extend the fusing unit idle time at low room temperatures.

S16	Waste Toner Bottle Set Sensor	Detects the position of the waste toner bottle and confirms whether it is set correctly.
S17	Waste Toner Bottle Near-Full Sensor	When the level of the waste toner rises high enough to move the actuator of this sensor out of its normal position, the sensor signals the machine that the waste toner bottle is nearly full.
S18	Waste Toner Bottle Full Sensor	Signals an alert when the waste toner bottle is full.
S19	Paper Feed Sensor - Tray 1	Detects the leading edge of each sheet of paper from the pick–up roller of tray 1 (tandem tray) and switches off the pick–up roller solenoid so the pick–up roller lifts.
S20	Vertical Transport Sensor - Tray 1	Detects the leading edge and trailing edge of each sheet fed from tray 1, 2, and 3 and signals a jam if the edges do not pass at the prescribed time.
S21	Paper End Sensor - Tray 1	Detects when the last sheet is fed from tray 1.
S22	Lift Sensor - Tray 1	Detects when the pick–up roller (pushed up by the top of the paper stack in the right side of the tandem tray) has reached the correct height for paper feed and then switches off the tray 1 (tandem tray) lift motor.
S23	Paper Near End Sensor - Tray 2	Detects the near end condition for tray 2 (middle tray, a universal cassette).
S24	Paper Near End Sensor: Tray 3	Detects the near end condition for tray 3 (middle tray, a universal cassette).
S25	Front Side Fence Open Sensor	Detects the actuator on the front side fence after it has reached the open position in the tandem tray.
S26	Front Side Fence Closed Sensor	Detects the actuator on the front side fence after it has reached the closed position in the tandem tray.
S27	Rear Side Fence Open Sensor	Detects the actuator on the rear side fence after it has reached the open position in the tandem tray.
S28	Rear Side Fence Closed Sensor	Detects the actuator on the rear side fence after it has reached the closed position in the tandem tray.
S29	Right Tray Down Sensor	Detects the bottom plate of the right tray and switches off the tray 1 lift motor and stops the bottom plate.

S30	Paper Near End Sensor - Tray 1	Signals 10% paper remaining when the actuator on the right rail of the right tray in the tandem tray passes.
S31	Paper Height Sensor	Signals 100% paper remaining until activated. Signals 50% paper remaining when the actuator on the left rail of the right tray in the tandem tray passes.
S32	Paper Height Sensor	Signals 30% paper remaining when the actuator on the left rail of the right tray in the tandem tray passes.
S33	Paper Height Sensor	When near end sensor 1 on right rail of the right tray of the tandem tray is actuated, and paper height sensor 3 has detected the passing of the actuator on the left rail, then the near end sensor signals 10% paper remaining.
S34	Right Tray Paper Sensor	Detects paper in the right side of the tandem paper tray.

S35	Rear Fence HP Sensor	Detects the actuator on the rear fence in the tandem tray and switches off the rear fence motor.
S36	Rear Fence Return Sensor	Detects the actuator on the rear fence in the tandem tray and reverses the rear fence motor.
S37	Left Tray Paper Sensor	Detects the presence of paper in the left tray of the tandem tray.
S38	Heating Roller Temperature Sensor	Monitors the surface temperature of the heating roller and breaks the circuits to the fusing lamps if the heating roller overheats.
S39	Waste Toner Lock Sensor	Signals an alert if the waste toner collection coil locks and stops rotating.
S40	Duplex Transport Sensor 1	The feeler of this sensor detects the leading edge and trailing edge of each sheet as it passes from the jogger unit above and into the horizontal feed path of the duplex unit below. Signals a jam if the paper does not arrive at or reach the sensor location at the prescribed time.
S41	Duplex Inverter Sensor	Detects the leading edge of the paper at the inverter exit roller and signals to switch off the reverse trigger roller solenoid to signal a jam if the paper does not arrive at the prescribed time.
S42	Duplex Entrance Sensor	Detects paper jams at the entrance of the duplex unit.
S43	Duplex Transport Sensor 3	Detects the leading edge and trailing edge of each sheet as it passes from the jogger unit above through the horizontal feed path of the duplex unit below. Signals a jam if the paper does not arrive at or reach the sensor location at the prescribed time.
S44	Duplex Transport Sensor 2	Detects the leading edge and trailing edge of each sheet as it passes from the jogger unit above and into the horizontal feed path of the duplex unit below. Signals a jam if the paper does not arrive at or reach the sensor location at the prescribed time.
S45	Duplex Jogger HP Sensor	At power on, detects the actuators on the jogger fences of the duplex unit, switches off the jogger motor and stops the fences at their home positions.
S46	Double-Feed Detection Sensor	Receives the light emitted from the double–feed detection LED and reflected from the surface of each sheet in the paper path. Signals an error if

		the thickness of the paper is not the same as the previous sheet.
S47	Guide Plate Position Sensor	
S48	Relay Sensor	Detects jams at the top of the vertical paper path.
S49	Registration Sensor	Detects the leading edge of the paper and switches off the registration motor and stops the registration roller briefly but long enough to correct buckle the paper.
S50	Paper Exit Sensor	Detects the leading and trailing edge of each sheet at the paper exit slot to check timing and detect jams.
S51	Bypass Paper Sensor	Detects the presence of paper in the bypass tray.
S52	Bypass Paper End Sensor	Signals paper out when the last sheet feeds from the bypass tray.

S53	Bypass Paper Size Sensor	Reads the positions of the side fences (manually adjusted) to detect the width of the paper in the bypass tray. (Paper length is read with pulse counts from the registration sensor.)
S54	Paper Exit Relay Sensor	Detects paper jams at the paper exit if the paper does not arrive or leave the machine at the prescribed time.
S55	Copy Tray Full Sensor (Option)	Detects when the Copy Paper Tray B75 is full and temporarily pauses printing so the operator can remove the stack from the tray and continue.
S56	TD Sensor: M	Monitors the amount of toner in the developer/toner mixture in the development unit of the Magenta PCU.
S57	TD Sensor : K	Monitors the amount of toner in the developer/toner mixture in the development unit of the Black PCU.
S58	Temperature/Humidity Sensor : PCU K	The temperature and humidity readings of this sensor are referenced to a lookup table stored in the ROM to 1) Correct the charge roller voltage , and 2) Set the length of time the agitators in the development unit rotate to mix the toner and developer.
S59	TD Sensor: Y	Monitors the amount of toner in the developer/toner mixture in the development unit of the Yellow PCU.
S60	TD Sensor: C	Monitors the amount of toner in the developer/toner mixture in the development unit of the Cyan PCU.

S61	ITB Position Sensor 2	Reads the encoder film strip on the front edge of the ITB and sends the sub scan scale signal to the CPU.
S62	ITB Position Sensor 1	Reads the encoder film strip on the front edge of the ITB and sends the main scan scale signal to the CPU.
S63	Potential Sensor : K	Reads the potential sensor pattern from the surface of the drum in the black PCU.
S64	Potential Sensor: M	Reads the potential sensor pattern from the surface of the drum in the magenta PCU.
S65	Potential Sensor: C	Reads the potential sensor pattern from the surface of the drum in the cyan PCU.
S66	Potential Sensor: Y	Reads the potential sensor pattern from the surface of the drum in the yellow PCU.
S67	Temperature Sensor: Optics 1	1 of 2 sensors (located near the left f-theta lens) that monitors the temperature in the optics unit. The results are used in the MUSIC process.
S68	Temperature Sensor: Optics 2	1 of 2 sensors (located near the right f-theta lens) that monitors the temperature in the optics unit. The results are used in the MUSIC process.
S69	Toner End Sensor: M	Detects toner end for magenta toner.
S70	Toner End Sensor : K	Detects toner end for black toner.
S71	Toner End Sensor: Y	Detects toner end for yellow toner.
S72	Toner End Sensor: C	Detects toner end for cyan toner.
S73	Scanner HP Sensor	Detects the home position of the scanner.

S74	Original Width Sensors	APS1 (a board) holds two original width sensors under the exposure glass. The detection combinations of these sensors determine the width of the original on the exposure glass positioned for LEF.
S75	Original Length Sensors - 1	APS2 (a board) holds two original length sensors under the exposure glass. The detection combinations of these sensors determine the length of the original on the exposure glass positioned for SEF.
S76	Original Length Sensor -2	APS3 (a board) holds one original length sensor under the exposure glass. The detection combination of this sensor and other sensors determine the length of the original on the exposure glass positioned for SEF.
S77	Accordion Jam Sensor	Detects jams at the fusing exit by confirming that paper arrives at the prescribed time.
S78	Fusing Exit Sensor	Detects jams at the fusing exit by confirming that paper leaves at the prescribed time.
S79	LCT Relay Sensor	Confirms whether the LCT is set correctly.

LEDs		
LED1	Double-Feed Detection LED	Emits light which is reflected from the paper to the double–feed detection sensor to test the translucence of each sheet for double-feed detection.
LED2	Accordion Jam Sensor (LED)	Flashes to show the user which lever to release to remove a paper jam from the fusing rollers.
LED3	Fusing Exit Sensor (LED)	Flashes to show the user which lever to release to remove a paper jam from the fusing unit.
SOLENOIDS		
SOL1	Pick–up Solenoid: Tray 2	Switches on when the tray 2 (middle tray) lift motor switches on. This solenoid lowers the pick–up roller of tray 3.
SOL2	Separation Roller Solenoid: Tray 2	When tray 2 (middle tray) is selected as the paper source, this solenoid energizes and brings the separation roller in contact with the feed roller until the leading edge of the sheet feeds to the paper feed sensor.
SOL3	Pick–up Solenoid: Tray 3	Switches on when the tray 3 (bottom tray) lift motor switches on. This solenoid lowers the pick–up roller of tray 3.

SOL4	Separation Roller Solenoid: Tray 3	When tray 3 (bottom tray) is selected as the paper source, this solenoid energizes and brings the separation roller in contact with the feed roller until the leading edge of the sheet feeds to the paper feed sensor.
SOL5	Pick–up Solenoid - Tray 1	Switches on when the tray 1 (tandem tray) lift motor switches on. This solenoid lowers the pick–up roller of tray 1.
SOL6	Separation Roller Solenoid - Tray 1	When tray 1 (tandem tray) is selected as the paper source, this solenoid energizes and brings the separation roller in contact with the feed roller until the leading edge of the sheet feeds to the paper feed sensor.
SOL7	Front Side Fence Solenoid -Tray 1	When the right tray paper sensor in the tandem tray signals paper out, and the left tray paper sensor signals paper present, this energizes this solenoid which pulls open the front side fence until the front side fence open sensor detects the actuator of the front side fence and switches off the solenoid, leaving it locked in the open position, to allow the rear fence to push the paper stack from the left tray into the right tray.
SOL8	Rear Side Fence Solenoid - Tray 1	When the right tray paper sensor in the tandem tray signals paper out, and the left tray paper sensor signals paper present, this energizes this solenoid which pulls open the rear side fence until the rear side fence open sensor detects the actuator of the rear side fence and switches off the solenoid, leaving it locked in the open position, to allow rear fence to push the paper stack from the left tray into the right tray.

SOL9	Right Tray Lock Solenoid - Tray 1	Releases the lock lever when the left tray paper sensor in the tandem tray signals that there is no paper in the left tray.
SOL10	Left Tray Lock Solenoid - Tray 1	When the rear fence motor in the tandem tray switches on, this energizes the left tray lock solenoid. This locks the left tray so it does not move while the rear fence pushes the stack from the left tray to the right tray.
SOL11	Duplex Junction Gate Solenoid	Controls the opening and closing of the duplex junction gate at the mouth of the inverter unit.
SOL12	Reverse Trigger Roller Solenoid	After a sheet is detected by the duplex entrance sensor, this solenoid energizes and pushes down the reverse trigger roller.
SOL13	Guide Plate Solenoid	Energizes when a jam occurs between the vertical transport rollers and registration roller to force the guide plate open and divert paper fed from below into the duplex tray.
SOL14	Inverter Junction Gate Solenoid	Operates the inverter junction gate. The inverter injunction gate turns paper into the path to the inverter unit below where it is 1) inverted for face–down output or 2) inverted for 2nd side printing.
SOL15	Bypass Pick–up Solenoid	Switches on and lowers the pick–up roller to the top of the stack in the bypass tray

SWITCHES		
SW1	Lower Front Door Switch	Detects whether the front door is open or closed.
SW2	Main Power Switch	Switches the machine off and on.
SW3	Upper Front Door Switches (x5)	Detect whether the front door is open or closed.
SW4	Paper Size Switch: Tray 2	The switch detects the position of the dial (set manually), and signals the paper size with a simple 5–digit binary code.
SW5	Paper Size Switch: Tray 3	The switch detects the position of the dial (set manually), and signals the paper size with a simple 5–digit binary code.
THERMISTORS		
TH1	Heating Roller Thermistor	Monitors the end of the heating roller and breaks the circuit to the heating lamps if a lamp overheats.
TH2	Hot Roller Thermistor	Detects and monitors the temperature of the hot roller for fusing temperature control.
TH3	Pressure Roller Thermistor	Detects the temperature of the hot roller for fusing temperature control.

THERMOSTATS				
TS1	Pressure Roller Thermostat 1	Monitors the temperature of the pressure roller and cuts the circuit if the pressure roller fusing lamp overheats.		
TS2	Pressure Roller Thermostat 2	Monitors the temperature of the pressure roller and cuts the circuit if the pressure roller fusing lamp overheats.		
TS3	Thermostat 1	Monitors the temperature of the fusing belt nd cuts the circuit if the fusing unit overheats.		
TS4	Thermostat 2	Monitors the temperature of the fusing belt nd cuts the circuit if the fusing unit overheats.		
TS5	Thermostat 3	Monitors the temperature of the fusing belt nd cuts the circuit if the fusing unit overheats.		
TS6	Thermostat 4	Monitors the temperature of the fusing belt nd cuts the circuit if the fusing unit overheats.		

ARDF

No.	Component	Function
MOTORS		
M1	Feed Motor	Drives the feed belt, and the separation, pick-up, and transport as far as the 1st transport roller.
M2	Transport Motor	Controls the original scanning speed.
M3	Exit Motor	Feeds paper out of the ARDF and onto the original exit table.
M4	Upper Inverter Motor	Controls the rotation of the upper inverter roller that feeds the original in and out of the upper inverter path.
M5	Lower Inverter Motor	Controls the rotation of the lower inverter roller that feeds the original in and out of the lower inverter path.
M6	Pick-up Motor	Raises and lowers the pick-up roller.
M7	Bottom Plate Lift Motor	Raises and lowers the bottom under the original stack.
PCB		
PCB1	ARDF Main Board	Controls the ARDF and communicates with the main copier boards.

SENSORS		
S1	Original Width Sensor 2	Detects paper wider than 191.5 mm (7.5 in.) measured from the reference point.
S2	Original Width Sensor 3	Detects paper wider than 230 mm (9.1 in.) measured from the reference point.
S3	Original Width Sensor 4	Detects paper wider than 263.5 mm (10.4 in.) measured from the reference point.
S4	Original Width Sensor 5	Detects paper wider than 288 mm (11.3 in.) measured from the reference point.
S5	Original Width Sensor 1	Detects paper wider than 138 mm (5.4 in.) measured from the reference point.
S6	Original Set Sensor	Detects whether an original is on the table.
S7	Bottom Plate HP Sensor	Detects whether the bottom plate is in the down position or not.
S8	Feed Cover Sensor	Detects whether the feed cover is open or not.
S9	Bottom Plate Position Sensor	Detects when the original is at the correct position for feeding.
S10	Upper Inverter Sensor	Detects leading and trailing edge of the paper as it enters and leaves the upper path of the inverter.
S11	LG Detection Sensor	Detects paper longer than 318 mm (12.5 in.) on the original table.
S12	A4 Detection Sensor	Detects paper longer than 291 mm (11.5 in.) on the original table.
S13	B5 Detection Sensor	Detects paper longer than 240 mm (9.5 in.) on the original table.

S14	Interval Sensor	Adjusts the timing of the original transport speed to the original scanning speed after the original feeds. During duplex scanning, or if original is small (B6, A5, or HLT) the interval sensor detects the leading edge of the original and delays the pre-scanning motor for the prescribed number of pulses to buckle the original and correct skew.
S15	Skew Correction Sensor	After pick-up and separation, the skew correction sensor detects the leading edge of the original. This signal slows the rotation of the entrance roller for a prescribed number of pulses to buckle the original and correct skew.
S16	Separation Sensor	Detects the separation of the original.
S17	Exit Sensor	Detects the leading and trailing edges of paper feed out to the original table and detects misfeeds. Also signals when to stop the scanning belt.
S18	Registration Sensor	Detects the leading edge and trailing edges of the original to detects jams and stops the original at the ADF exposure glass to correct buckle.
S19	Pick-up Roller HP Sensor	Detects whether the pick-up roller is up or not.
S20	Lower inverter sensor	Detects the original in the path of the lower inverter before it feeds to the inverter rollers for 2nd side scanning, or feeds to the exit rollers for exit.
S21	ARDF Position Sensor	Detects whether the ARDF unit is up or down for scanning on the main exposure glass (book mode).
S22	APS Start Sensor	Signals the CPU when the DF is opened and closed (for platen mode) so that the original size sensors in the copier can check the original size.

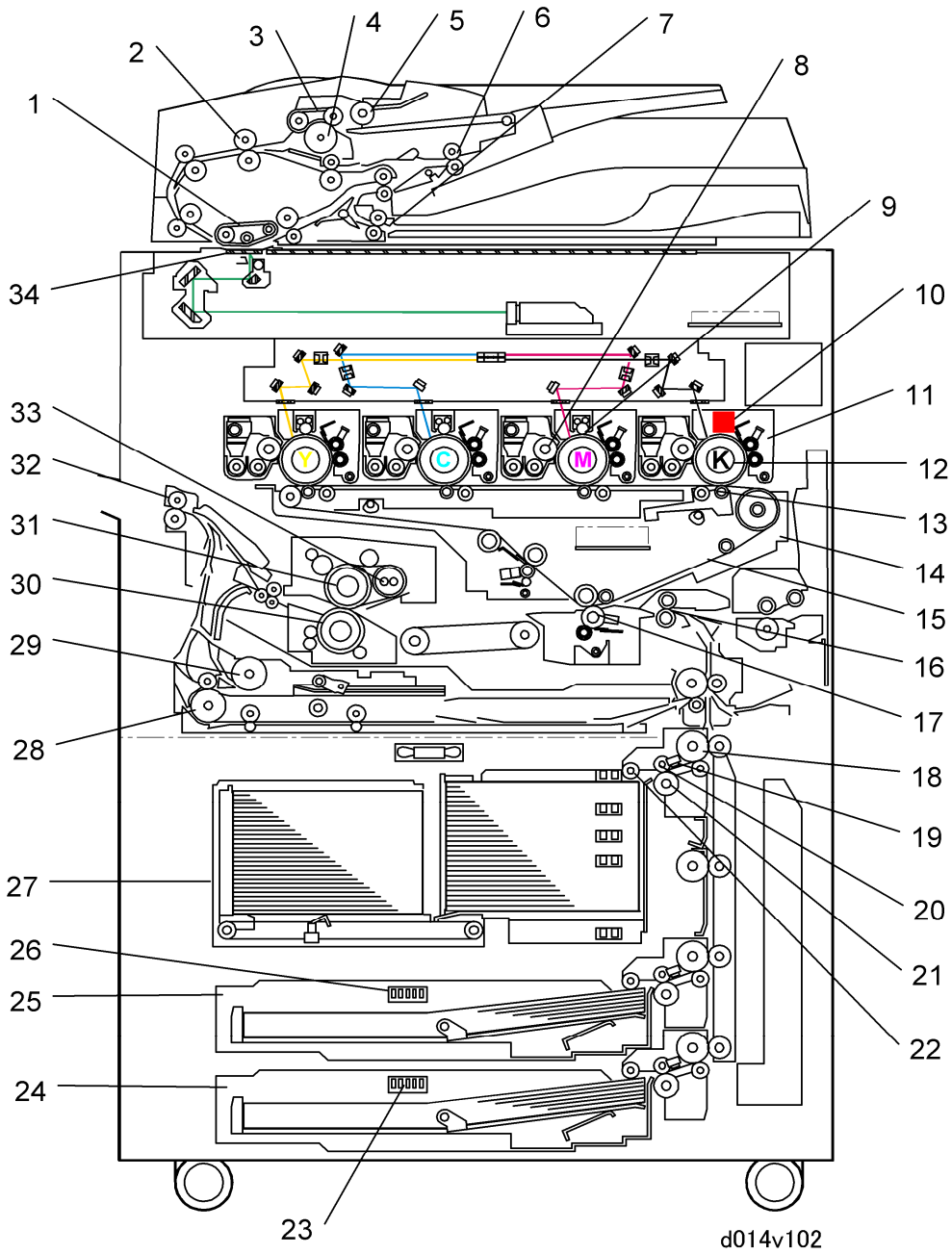
SOLENOIDS				
SOL1	Upper Inverter Solenoid	Opens and closes the upper junction gate at the entrance of the upper inverter path. During simplex scanning, closes the upper inverter path so the original exits straight to the exit tray. During duplex scanning, opens to allow the original to enter the upper inverter path and closes to direct it once again into the feed path for 2nd side scanning.		
SOL2	Lower Inverter Solenoid	Opens and closes the lower junction gate. During duplex scanning opens after the 2nd side is scanned to direct the original into the lower inverter path while the next sheet is fed to the upper inverter path above, then closes to direct the original out onto the original exit tray.		

DETAILED DESCRIPTIONS

DETAILED DESCRIPTIONS

General Overview

Main Machine



1. Transport Belt (ARDF)
2. Grip Roller (ARDF)
3. Feed Belt (ARDF)
4. Separation Roller (ARDF)
5. Pick-up Roller (ARDF)
6. Upper Inverter Roller (ARDF)
7. Lower Inverter Roller (ARDF)
8. Development Roller
9. Charge Roller
10. Charge Corona Unit
11. PCU
12. OPC Drum
13. Image Transfer Roller
14. ITB Unit
15. Transfer Belt
16. Registration Roller
17. PTR Roller
18. Grip Roller
19. Feed Sensor (Paper Tray)
20. Feed Roller (Paper Tray)
21. Separation Roller (Paper Tray)
22. Pick-up Roller (Paper Tray)
23. Paper Size Switch (Tray 3)
24. Universal Tray (Tray 3)
25. Universal Tray (Tray 2)
26. Paper Size Switch (Tray 2)
27. Tandem Tray (Tray 1)
28. Inverter Exit Roller
29. Inverter Entrance Roller
30. Pressure Roller
31. Hot Roller
32. Exit Roller
33. Heating Roller
34. Exposure Glass (ARDF)

The color PCU units (Y,M,C) use a charge roller to charge the surface of the OPC drum. The K PCU uses a charge corona unit (Scorotron type) to charge the surface of the drum.

Laser Unit

There is an LD unit for each color, and each LD unit uses a two-beam system. A photodiode (PD) in each LD unit detects the light emitted from the LD unit. The output of the PD is fed back to the LD control board. The LD control board uses this information to control the amount of light to make sure that it remains at the correct level.

Dual Beam Writing

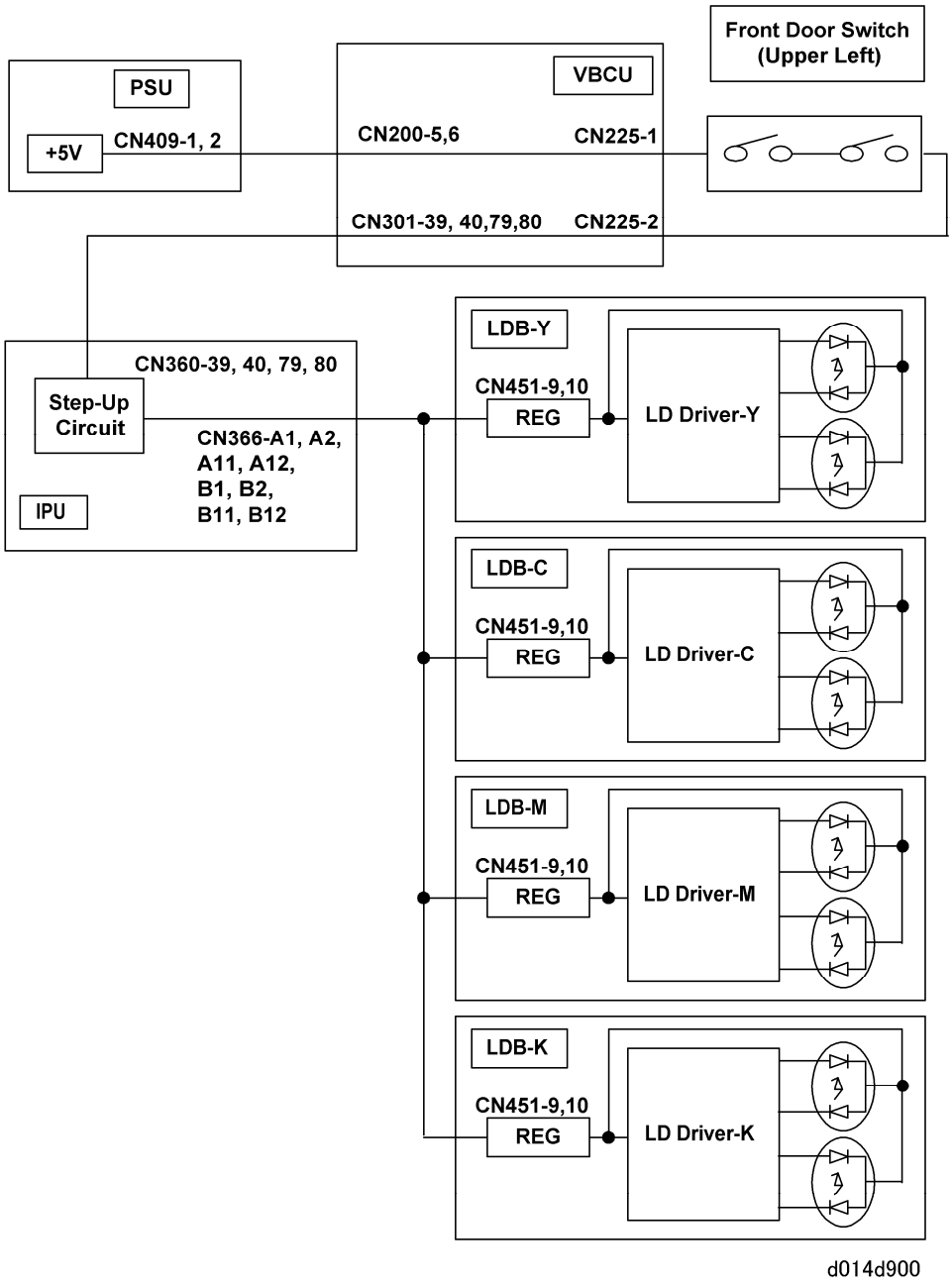
In each LD unit, two beams move across the drum in the main scan direction.
The use of two beams:

- Makes the machine print faster.
- Reduces the number of turns of the polygon mirror for a page to prolong the service life of the motor.
- Reduces the amount motor noise.

The beam pitch is fixed at 600 dpi and is not adjustable.

LD Safety Switches

To ensure the safety of customers and customer engineers, two switches inside the cover prevent the laser beams from switching on accidentally. When the front cover is open, the +5V line connecting each LD driver on the LD control board is disconnected.


Front Door Switch
(Upper Left)
PSU
VBCU
+5V
CN409-1, 2
CN200-5,6
CN225-1
CN301-39, 40,79,80
CN225-2
CN360-39, 40, 79, 80
Step-Up
Circuit
CN366-A1, A2,
A11, A12,
B1, B2,
B11, B12
IPU
LDB-Y
CN451-9,10
REG
LD Driver-Y
LDB-C
CN451-9,10
REG
LD Driver-C
LDB-M
CN451-9,10
REG
LD Driver-M
LDB-K
CN451-9,10
REG
LD Driver-K
d014d900

Boards

Overview of Important Components

VBCU (Base Engine and Image Control Unit)

The VBCU is the main control board. It combines the functions of the BCU and IOB.

The VBCU controls these BCU (Base Control Unit) functions:

- Engine sequence control (all sensors, motors, fusing temperature control circuits)
- Image processing control (on the IPU)
- Scanning control
- GW controller interface
- Peripheral timing control

The VBCU also controls these IOB (I/O Control Board) functions:

- Input and output ports for all sensors, motors, solenoids
- All drivers
- High voltage power supply
- Analog input signals. Converts analog data to 10-bit digital data. The CPU on the VBCU reads this data.

Controller

The GW controller board controls all the optional applications. It contains the GW architecture ASICs, and connects to the VBCU and PCI interface. The controller board also has two SD card sockets. The SD card slots are use for:

- Installing holding optional applications (Printer/Scanner, PostScript3 and other options)
- Engine and operational panel firmware updates
- Moving an application from one SD card to another with SP5873-1.

SBU (Sensor Board Unit)

The SBU:

- Receives analog signals from the CCD and converts them to digital signals.
- Sends serial data to the VBCU.
- Sends signals from the main CPU to the SIOB, to control the scanner components.
- Sends digital data to the IPU.

SIOB (Scanner I/O Board)

This board controls the scanner motor and all the sensors in the scanner unit. The CPU controls this board.

LDB (Laser Diode Drive Board)

This board contains the driver for the laser diodes.

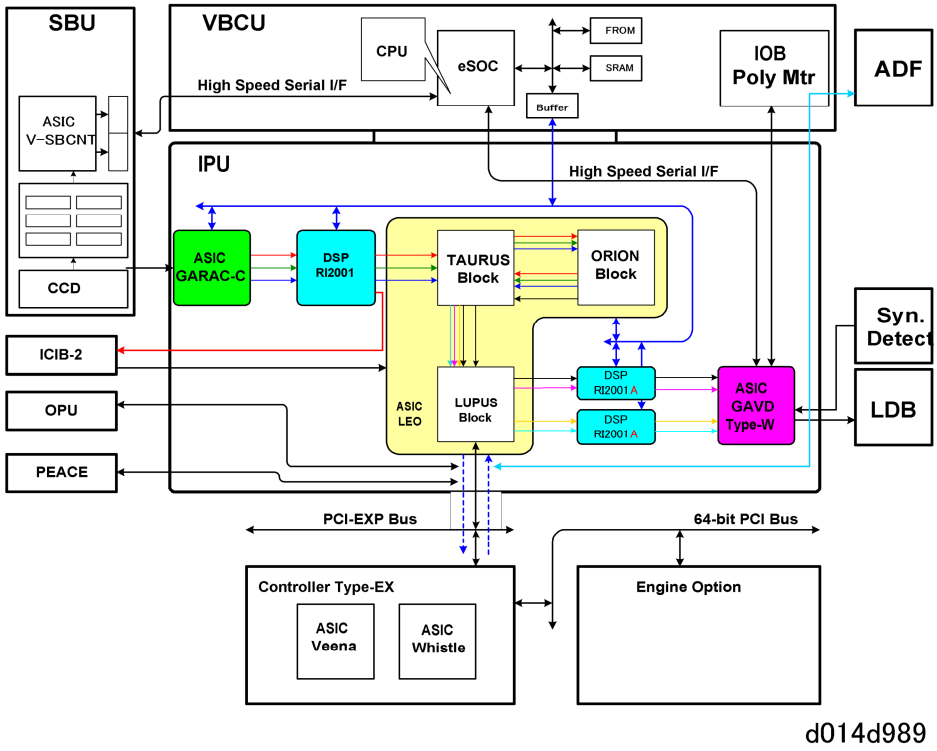
HDD (Hard Disk Drives)

This board stores all the temporary files for job processing and all permanent files for the document server.

PSU (Power Supply Unit)

Supplies DC to the machine, and contains the AC supply that controls the power to the fusing lamps.

IPU



SBU (Sensor Board Unit)

SBU

The SBU does the following functions:

- Black level correction
- White level correction
- Color balance calibration
- Creating the SBU test pattern

Operation Summary

The signals from the 3-line CCD, one line for each color (R, G, B) and 4 analog signals per line (F_ODD, F_EVEN, L_ODD, L_EVEN), are sampled by the ASIC and converted to digital signals in the 10-bit A/D converter. This is the first phase of processing the data scanned from the original.

Lens Block Replacement

The controller stores the SBU settings. These values must be restored after the lens block is replaced:

SP4008	Sub Scan Mag	Sub Scan Magnification Adjustment
SP4010	Sub Scan Reg	Sub Scan Registration Adjustment
SP4011	Main Scan Reg	Main Scan Registration Adjustment

- Before lens block replacement, enter the SP mode and note the settings of SP4800 001 to 003 (ARDF density adjustments for R, G, B).
- After lens block replacement, do some copy samples with the ARDF, then check the copies.
- If the copies have background, change SP4800 001 to 003 to their previous settings, or adjust until the background is acceptable.

These SP codes are also used to adjust the ARDF scanning density, if the scanning densities of the ARDF and the platen mode are not the same.

SBU Test Mode

3. Use SP4907 (Set SBU Test Pattern) to select the pattern to print.
4. Touch "Copy Window" then press the Start key twice.

IPU (Image Processing Unit)

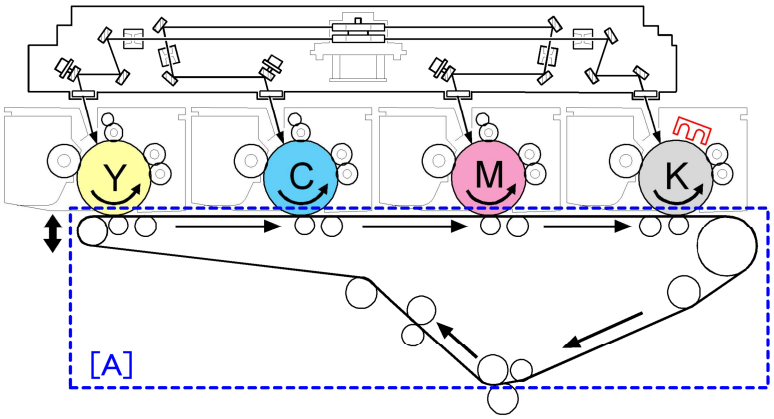
The IPU does the following:

- Controls the scanner
- Processes the image signals from the SBU and sends them over the PCI bus to the controller memory
- Receives the image processing signals sent over the PCI bus from the controller memory, processes them, then outputs them to the VGAVD.
- Outputs the control signals for the ARDF
- Controls the relay of power and signals

Image processing, ADS correction, and line width correction are done on the VBCU board for all the digital data sent from the SBU. Finally, the processed data is sent to the printer as digital signals (2 bits/pixel).

Copy Process Overview

Raising and Lowering of the ITB Unit

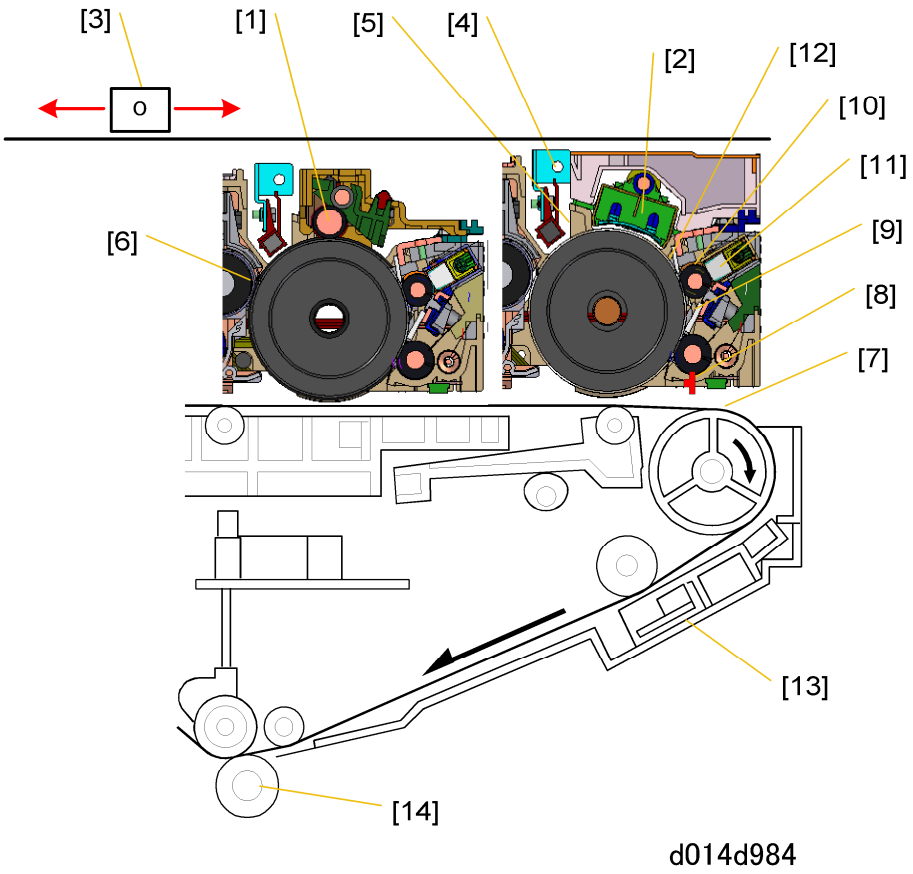


d014d001

This machine has four PCUs arranged in a straight line: Y, C, M, K above the ITB (Image Transfer Belt) unit [A]:

- The ITB lift motor raises and lowers the ITB unit.
- The ITB lift motor raises ITB unit for full-color copying. The drum of every PCU contacts the image transfer belt below.
- The ITB lift motor lowers the ITB for black-and-white copying. Only the black PCU (K) contacts the image transfer belt below.
- To reduce wear on moving parts of the color PCUs, the drums of the color PCUs (Y, M, C) do not rotate while they are separated from the image transfer belt during black-and-white copying.
- If a job contains black-and-white pages and full-color pages, the action of the ITB is controlled by SP3930-1.

The Copy Process



Here is a general description of the copy process.

Drum Charge

In darkness a charge roller [1] in the color PCUs (Y,C,M) and a charge corona unit in the black PCU (K) [2] give a negative charge to each drum. The charge stays on the surface of the drum because the OPC layer has a high electrical resistance in the dark.

Exposure

A xenon lamp [3] exposes the original as it scans over the exposure glass above. Light reflected from the original passes to the CCD, where it is converted into an analog data signal. This data is converted to a digital signal, processed, and stored in the memory. At the time of printing, the data is taken from the memory and sent to the laser diode. For multi-copy runs, the original is scanned once and stored in a temporary file on the hard disk.

Laser Exposure

The processed image data from the scanned original is taken from the hard disk and two laser beams [4] fire and write it as an electrostatic latent image on the drum surface. The amount of charge used to create the latent image on the drum depends on the intensity and duration electrical pulse that fires the laser beam pulse.

Drum Potential Sensor

There are four drum potential sensors [5], one mounted on the main machine above each PCU. These sensors detect and measure the electrical potential on the surface of each drum. This is necessary because frequent and temporary changes in temperature and humidity, as well as the changes in the surface of the drum as it ages, affect drum potential. The machine uses the readings of these sensors to set the voltage levels that are frequently adjusted during auto process control. This ensures optimum performance of copying and printing.

Development

The magnetic developer brush of the development roller [6] brushes over the latent image on the rotating drum surface. Toner particles are electrostatically pulled from the magnetic developer brush onto the drum surface where the laser reduced the negative charge on the drum. The attracted toner is applied over the latent image.

Image Transfer

The developed toner images are transferred from the drums to the image transfer belt (ITB) [7]. Rollers under the ITB apply a high positive charge to the reverse side of the ITB. This positive charge pulls the toner particles from the surface of the drum to the ITB. The toner pulled from the drum creates a duplicate of the image pattern on the surface of the belt.

Quenching

The light from the quenching lamp [8] neutralizes the charge that formed the image on the drum surface. After cleaning and quenching, the drum surface is ready for the next cycle.

Drum Cleaning

The opposing cleaning blade [9] removes toner remaining on the drum after transfer of the image. The soft lubricant brush roller [10] applies lubricant (ZnSt from the lubricant bar [11]) to the area cleaned by the cleaning blade. Finally, the lubricant blade [12] smoothes and levels the lubricant applied to the OPC.

ID Sensors, Music Sensors

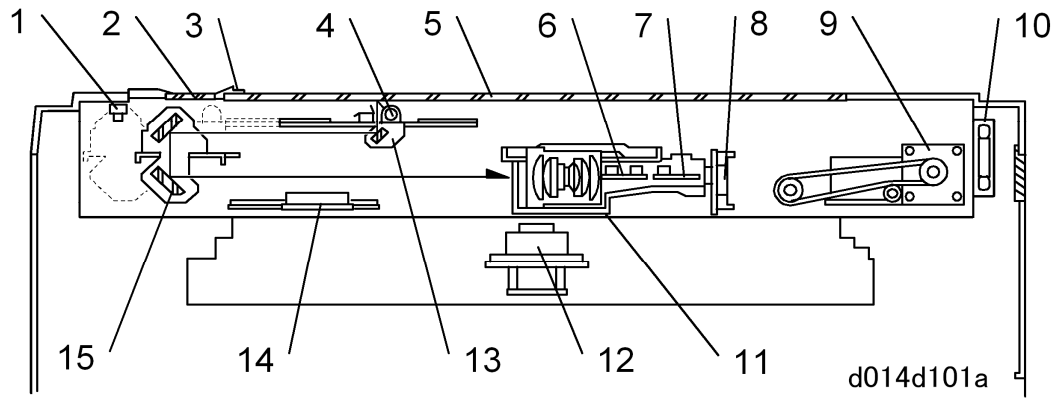
An ID sensor and three MUSIC sensors [13] are mounted over the surface of the image transfer belt. The laser in each PCU writes an ID sensor pattern on each drum surface (Y, M, C, K) at prescribed intervals then these patterns are transferred to the image transfer belt. The ID sensor above the patterns on the ITB measures the light reflected from each of the four patterns and sends this data (Vsp) to the CPU. These Vsp readings are used for toner supply control. The MUSIC sensors read a different set of patterns. These readings are used to 1) adjust the start timing for laser firing, 2) adjust the angle of the 3rd mirror, and 3) set the drum rotation speeds. The MUSIC sensor readings are used to ensure that the alignment of the images on the ITB is always correct.

Paper Transfer and Separation

A strong negative charge applied to the PTR idle roller [14] repels and pushes the image from the image transfer belt onto the paper. Immediately after this is done, a paper discharge plate neutralizes the charge on the paper and image transfer belt. The curvature of the feed path makes the paper to separate from the image transfer belt.

Scanner Unit

Overview



1. Scanner HP Sensor
2. ARDF Exposure Glass
3. White Plate
4. Exposure Lamp (Xenon)
5. Exposure Glass
6. APS2 (Org. Length Sensors 1, 2)
7. APS3 (Org. Length Sensor 3)
8. SBU (CCD: 600 dpi)
9. Scanner Motor
10. Scanner Fan Motor
11. Lens Block
12. Polygon Mirror Motor
13. 1st Scanner
14. APS1 (Org. Width Sensors 1, 2)
15. 2nd Scanner

The light reflected from the original is sent to the CCD:

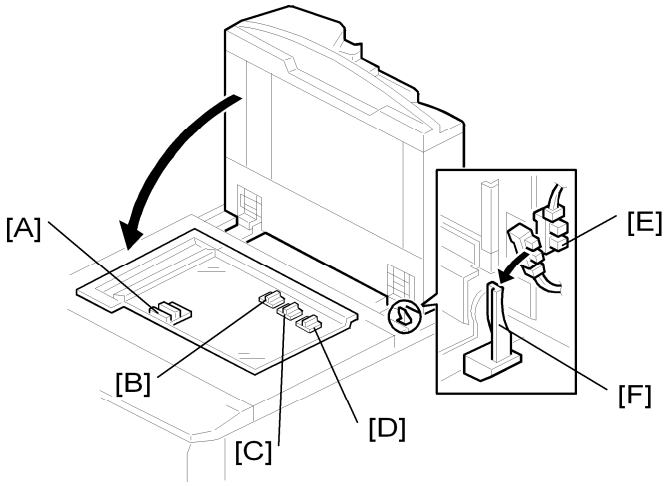
1st Mirror> 2nd Mirror> 3rd Mirror> Lens Block> CCD

The lens block consists of the scanner lens and SBU (CCD). The CCD converts the light that was reflected from the original and converts it to three color analog signals (R, G, B). The SBU converts the analog signals to digital signals, then sends the digital signals to the IPU.

Important

- The lens block is always replaced as a unit and requires no adjustment in the field.

Original Size Detection



d014d102

The machine uses five sensors on three APS boards to detect the size of the original on the exposure glass.

[A]: APS1. (W1 and W2) detects original width

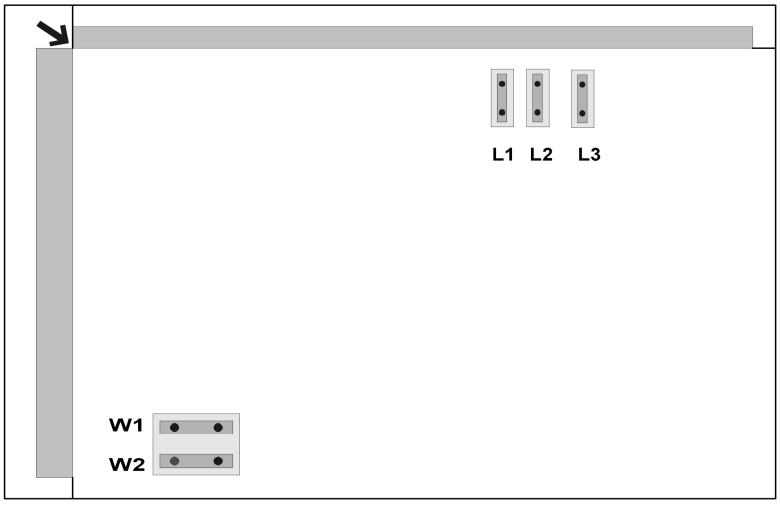
[B]: APS2. (L1) detects original length

[C]: APS3 (L2) detects original length

[D]: APS4. (L3) detects original length

[E]: ARDF position sensor. Detects whether the ARDF is open or closed.

[F]: APS start sensor. Triggers automatic paper size detection.



d014d973

The table shows the sensor output for each paper size.

If an original is on the exposure glass, you can check the sensor output with SP4301 (APS Confirm).

A4/A3	LT/DLT	L3	L2	L1	W1	W2	SP4301 Display
A3	11" x 17"	1	1	1	1	1	000 11111
B4	—	1	1	1	1	0	000 11110
A4 SEF	8½" x 11"	0	1	1	0	0	000 01100
	8½ x 14"	1	1	1	0	0	000 11100
A4 LEF	11" x 8½"	0	0	0	1	1	000 00011
B5 SEF	—	0	0	1	0	0	000 00100
B5 LEF	—	0	0	0	1	0	000 00010
A5 SEF	5½" x 8½"	0	0	0	0	0	000 00000
A5 LEF	8½" x 5½"	0	0	0	0	0	000 00000

1: On (Paper Detected), 0: Off (Paper Not Detected)

Note: If the original is small (such as A5-LEF), all sensors are off and the machine shows that the original size cannot be detected. However, you can force the machine to detect A5/HLT in this case if you adjust SP4303 (there are settings for A5/HLT SEF and A5/HLT LEF).

Detection Timing

The APS sensors are always active when the machine is powered on, but the CPU checks their signals only after the platen has been lowered.

Book Mode

When the ARDF is open in the Book mode, the CPU checks the APS sensors and determines the original size after the [Start] key has been pressed.

ARDF Mode

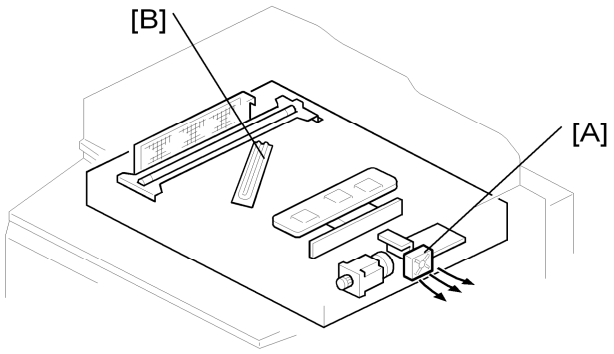
The CPU checks the APS sensors after the platen has been lowered.

By-pass Mode

The APS sensors are ignored when copy paper is fed from the by-pass tray, but the by-pass tray can handle a variety of sizes and orientations. To accomplish this:

- The machine always assumes short-edge feed for paper on the by-pass tray.
- Width is measured by a sensor inside the by-pass tray.
- The bypass tray cannot measure length, so the registration sensor determines the length of the paper using clock pulses.

Scanner Unit Fan and Anti-Condensation Heater



d014d104

Condensation on the mirrors can cause:

- Running, smearing and image borders
- Printing completely black or gray pages

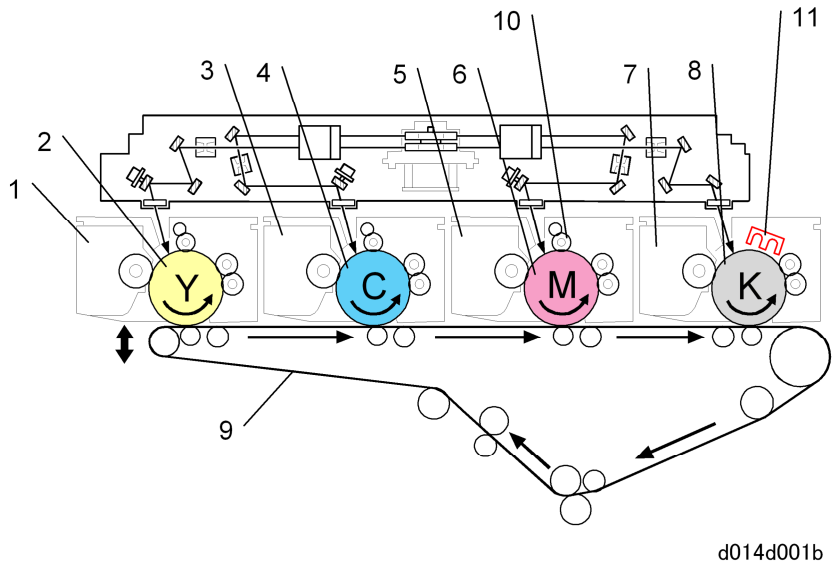
The scanner unit is provided with a cooling fan [A] and anti-condensation heater [B] to keep the unit cool and dry. The fan pulls the heater air from around the PCBs and blows it out of the scanner unit.

The anti-condensation heater turns on when:

- The main power switch is turned off.
- The operation switch is turned off.
- The machine enters the auto off mode.

Photoconductor Units (PCU)

Overview



1. Development Unit (Y)
2. Drum (Y)
3. Development Unit (C)
4. Drum (C)
5. Development Unit (M)
6. Drum (M)
7. Development Unit (K)
8. Drum (K)
9. Image Transfer Belt (ITB)
10. Charge Roller
11. Charge Corona Unit

Four PCU units (Y, C, M, K) are arranged in tandem from left to right. There is one PCU for each color. Each PCU consists of a development unit and drum unit pair (1)(2), (3)(4), (5)(6), (7)(8). The image that is developed on each drum transfers to the image transfer belt (9). Each color transfers onto the image transfer belt, one after the other (Y,C,M,K) during one pass of the ITB under the PCUs.

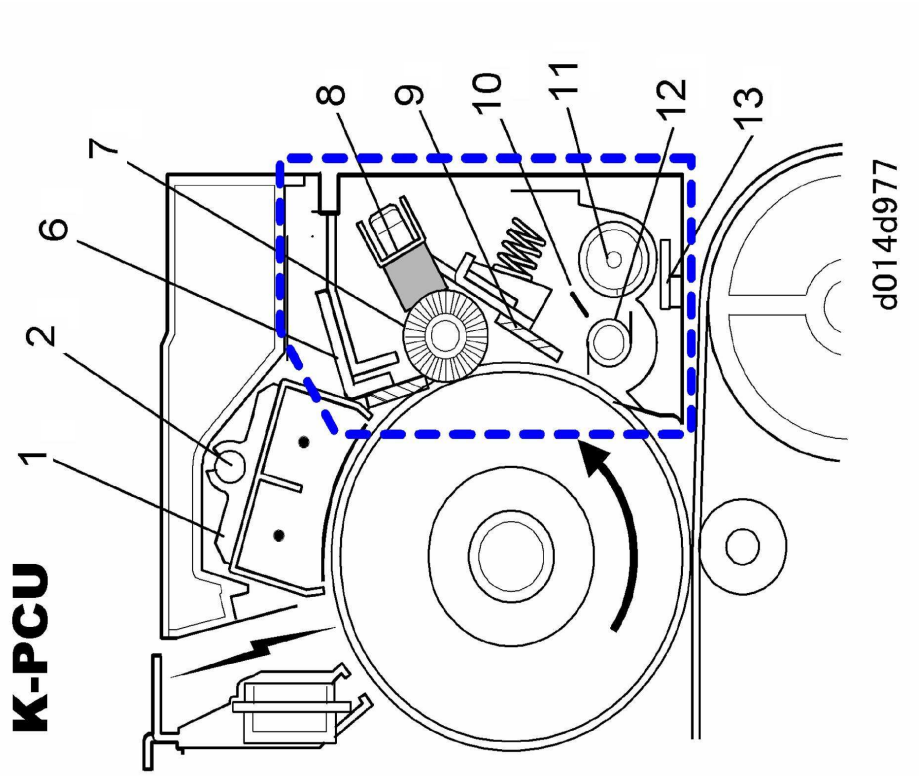
- The Y, C, and M PCUs all use a charge roller, for example (10) in the M_PCU, to charge the drum surface.
- The K_PCU, however, uses a charge corona unit to charge its drum.

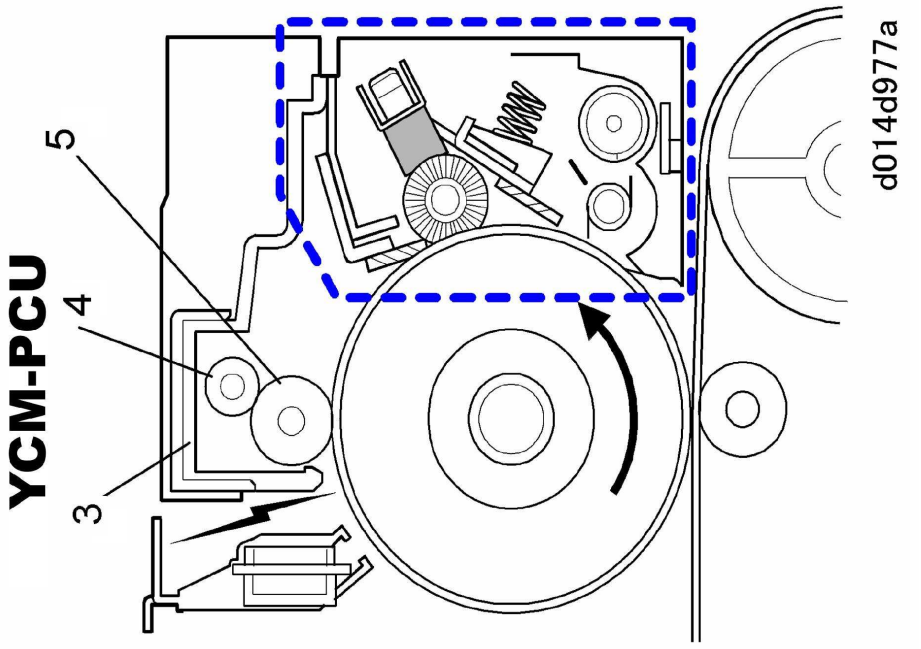
- Also, only the K_PCU has a temperature sensor that is used to correct process control parameters (charge voltage, for example) during process control.

All other parts of the PCU units (cleaning and development components) are identical. Only the methods of charge differ.

Around The Drum

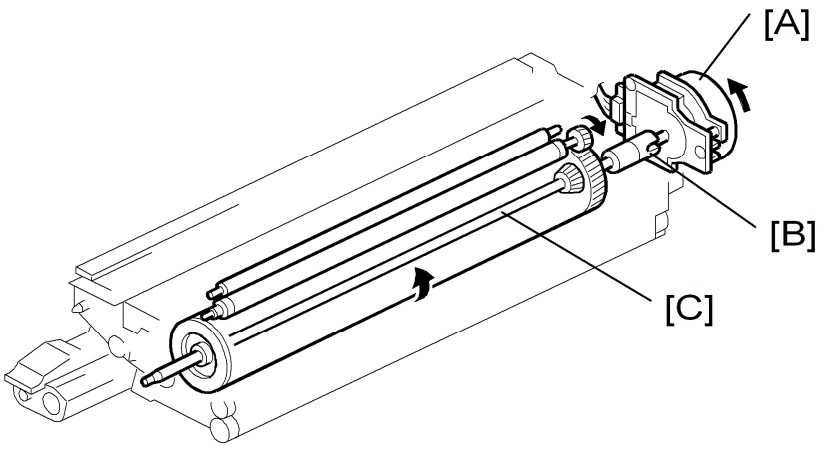
In this machine, the K PCU employs a change corona unit and the other PCUs (Y, C, M) use charge rollers.





1	Charge Corona Unit (Scorotron type)	Only the K PCU uses a charge corona unit.
2	Charge Corona Wire Cleaner	
3	Charge Roller Unit	The Y, M, C PCUs use charge rollers.
4	Charge Roller Cleaning Roller	
5	Charge Roller	
6	Lubricant Blade	These items comprise the PCU cleaning system. The same parts and system are used in all of the four PCU units.
7	Lubricant Brush Roller	
8	Lubricant Bar	
9	Cleaning Blade	
10	Cleaning Brush Roller Flicker	
11	Toner Collection Coil	
12	Collection Coil	
13	Quenching LED	

Drum Drive



d014d204

[A]: Drum motor

[B]: Drum motor coupling

[C]: Drum shaft

Each PCU (Y, C, M, K) has an independent drum motor.

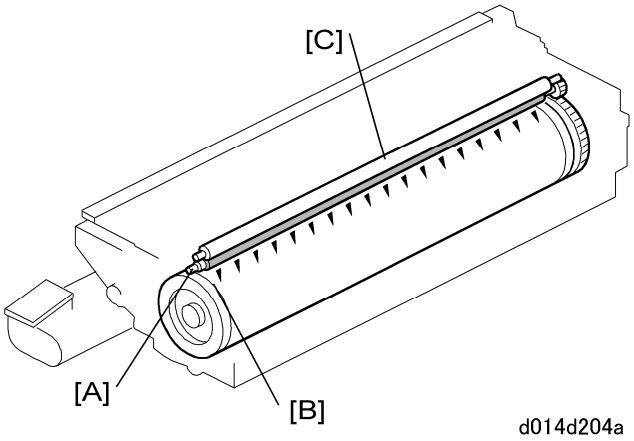
The drum motor [A] turns the drum motor coupling [B] that rotates the drum motor shaft [C].

During black-and-white copying and printing, only the black drum (K) rotates. The other color drums (Y, M, C) do not rotate.

Drum Charge

The Y,C,M PCU units employ a charge roller to charge the drum. The K_PCU uses a charge corona wire.

YCM PCUs



[A]: Charge roller

[B]: Drum

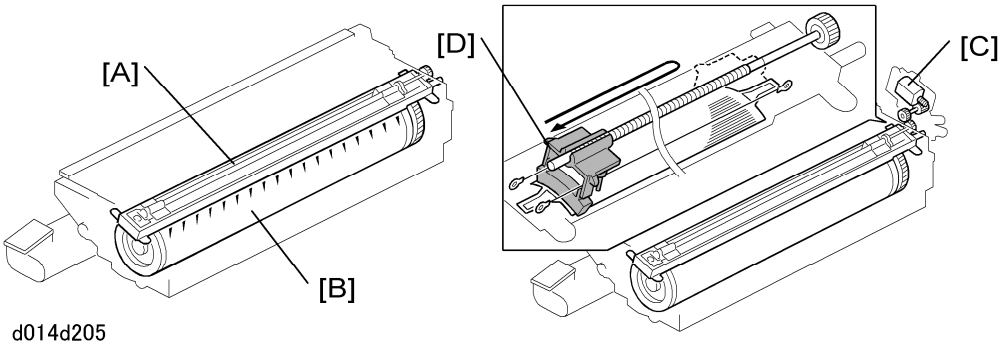
[C]: Charge roller cleaning roller

The charger roller [A] above the drum [B] charges the drum.

The charge roller cleaning roller [C] touches the charge roller and cleans it as the charge roller and cleaning roller rotate in opposite directions. The gap between drum and charge roller is 0.05 mm.

- The charge roller is the same length as the drum to ensure an even charge along the entire length of the drum.
- The charge roller receives its charge from the charge roller power pack. The power pack is connected at a terminal attached to the end of the charge roller shaft.

K PCU

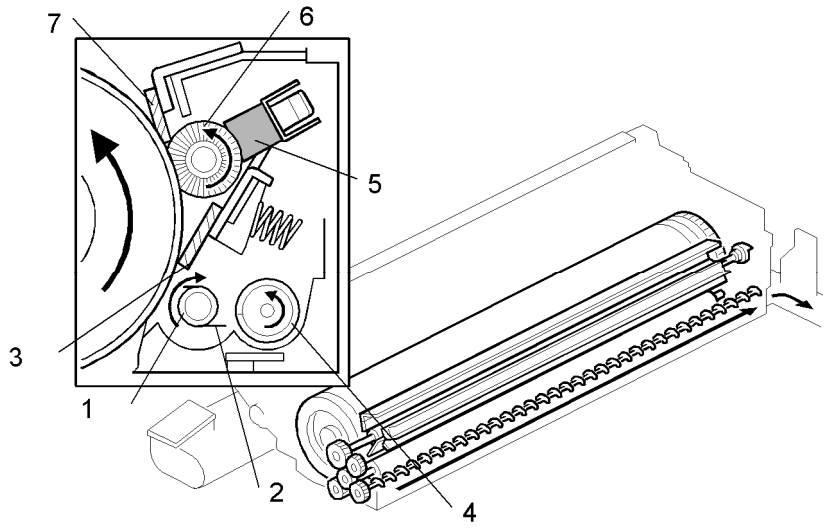


The CGB power pack (a constant dc power pack) applies a high electrostatic charge to a pair of corona wires [A] suspended above the OPC drum [B]. The corona of this wire charges the surface of the drum below.

The amount of ozone generated during drum charging is much more than the amount generated with the charge roller system used in the YMC PCUs. For this reason, the ozone filter of this machine has been enlarged and more fans have been installed around the ozone filter.

The charge wire cleaning motor [C] switches on at the time set with SP2220-1 to move the charge wire cleaning pad [D] one stroke forward and one stroke back to clean the wires. This keeps the wires free of dirt and ensures a uniform charge corona.

Drum Cleaning and Lubrication



d014d203

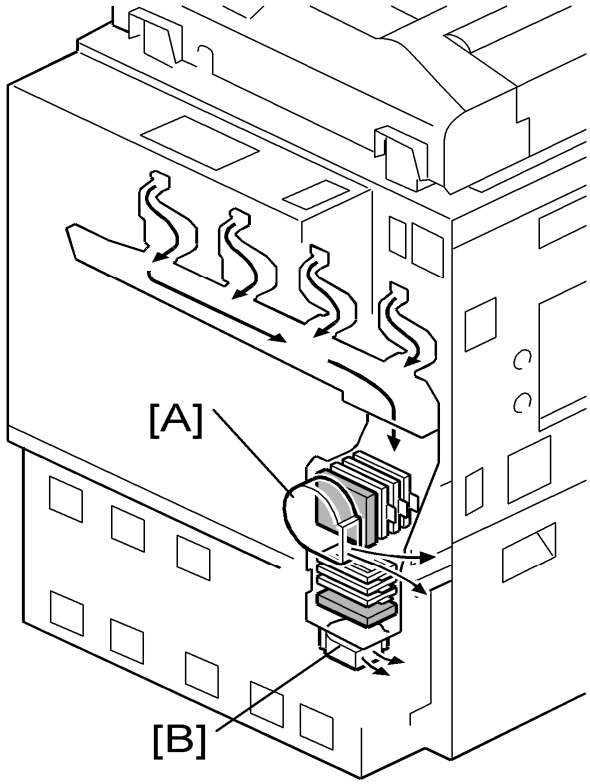
To improve the efficiency of cleaning, the drum is lubricated with ZnSt (Zinc Stearate).

This cleaning sequence is the same in each PCU:

- The cleaning brush roller [1] brushes residual toner and other matter from the surface of the drum.
- The cleaning roller flicker [2] combs the cleaning brush roller to remove toner from the brush.
- The cleaning blade [3] (a counter blade) scrapes toner from the drum.
- All collected toner falls down into the toner collection coil [4]. This revolving coil moves the used toner to the used toner port at the back of the PCU.
- The lubricant bar [5] supplies lubricant (ZnSt) to the lubricant brush roller [6], and the lubricant brush roller applies the lubricant to the drum.
- Finally, the lubricant blade [7] smoothes the powder lubricant applied to the surface of the drum by the lubricant brush roller.

PCU Ventilation

Ozone Ventilation



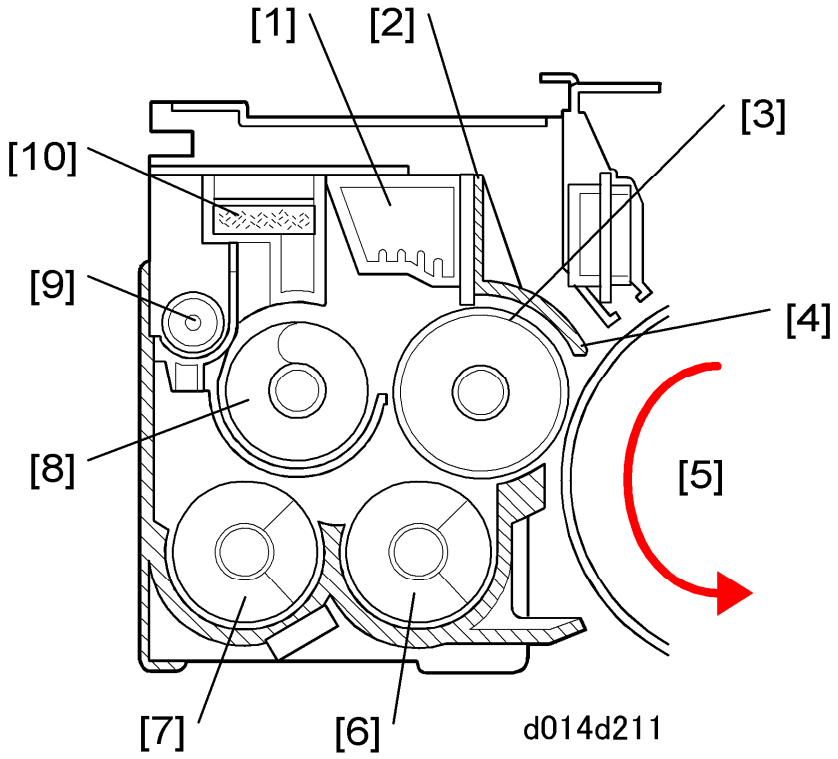
d014d962

Ozone exhaust fan [A] pulls air from the machine through the first air filter/ozone filter unit and expels it from the machine.

Ozone exhaust fan [B] pulls air through the second air filter/ozone filter unit and expels it from the machine.

Development Unit

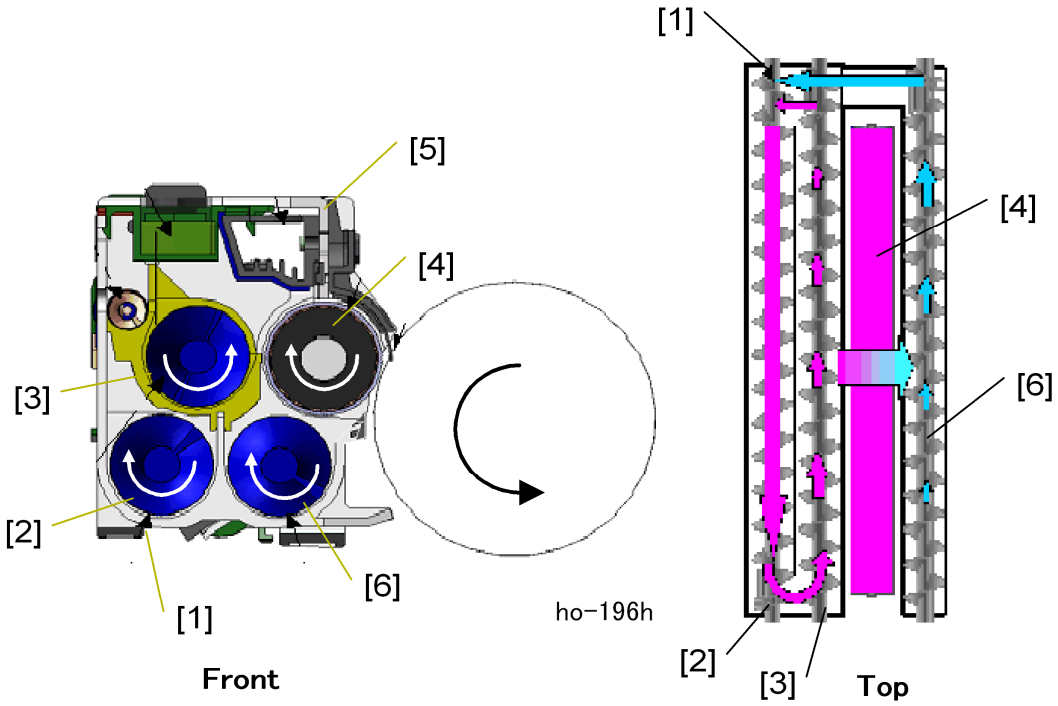
Overview



1.	Heat Sink
2.	Doctor Blade (t=2.0)
3.	Development Roller
4.	Entrance Seal
5.	Drum (dia. 60)
6.	Toner Collection Auger (dia. 25)
7.	Development Auger (dia. 22)
8.	Supply Auger (dia. 22)
9.	Excess Toner Auger
10.	Filter

Development method:	Dual-component development
Agitation:	Two augers
Development unit drive:	Development motor, one for each development unit (Y, C, M, K)
Development bias:	Development bias power pack

Development Unit Operation



When the development unit is filled with new developer from the developer bottle, all the developer falls into the unit across its full length. Toner is supplied through a small port at the front of the development unit.

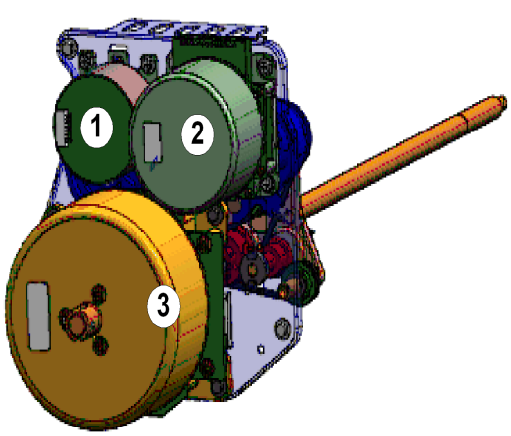
The toner enters the toner supply port [1].

The development auger [2] cross-mixes the developer and toner sent from the STC, and then sends this mixture to the supply auger [3] next to the development roller [4]. The magnetic development roller pulls the developer-toner mixture onto its surface as it rotates.

Near the top of the development unit, the doctor blade [5] cuts and smoothes the developer/toner mixture to the correct thickness. The development bias power pack (not

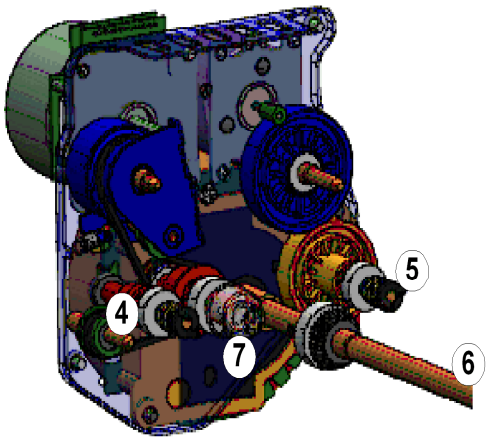
shown) applies the bias to the development bias terminal that is attached to the shaft of the development roller. Excess toner removed by the doctor blade drops into the toner collection auger [6].

Development, PCU Unit Drive



Front

ho-200a



Rear

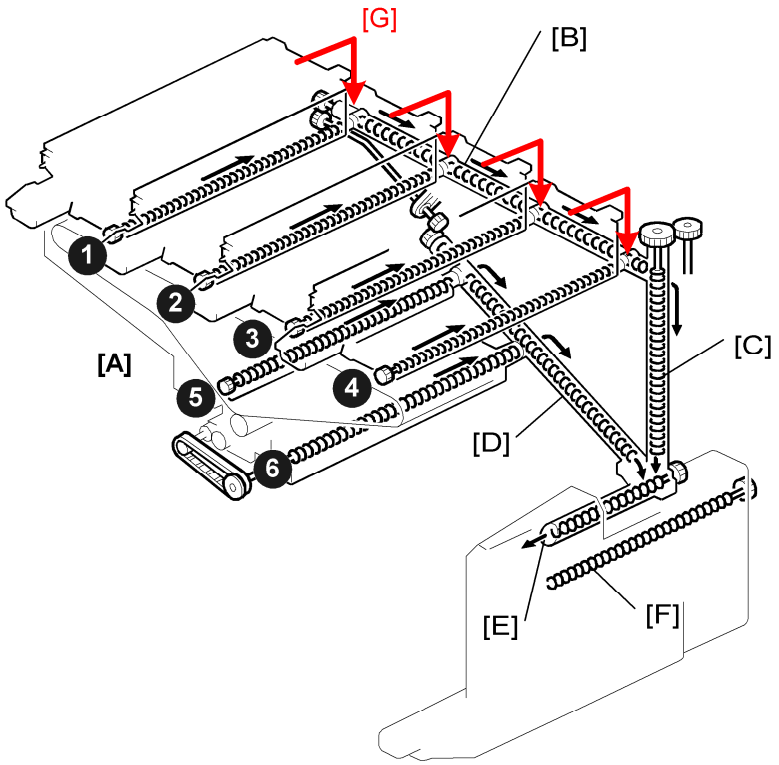
ho-200b

6ho-mtr1

1.	Drum Cleaning Motors x4
2.	Development Motors x4
3.	Drum Motors x4
4.	Development Auger Shaft
5.	Drum Cleaning Motor Shaft
6.	Drum Motor Shaft
7.	Development Roller Shaft

Used Toner Collection

Used Toner Path



d014d215

[A]	Used Toner Collection Coils		[B]	Horizontal Used Toner Transport Coil
	①	PCU (Y)	[C]	Vertical Used Toner Transport Coil
	②	PCU (C)	[D]	Diagonal Used Toner Transport Coil
	③	PCU (M)	[E]	Used Toner Bottle Transport Coil
	④	PCU (K)	[F]	Used Toner Distribution Coil
	⑤	ITB Unit	[G]	Excess Toner Ports
	⑥	PTR Unit		

Excess toner from the OPC drums drops from the new excess toner collection coils onto the horizontal used toner transport coil. (Please refer to the next section below.)

[A]: Used Toner Collection Coils

Six used toner collection coils (1 for each PCU and 1 each for the ITB and transfer roller) transport used toner away from these components after cleaning. The PCU motors drive coils ① to ④. The PTR motor drives coils ⑤ and ⑥.

①	PCU (Y)
②	PCU (C)
③	PCU (M)
④	PCU (K)
⑤	ITB Unit
⑥	PTR Unit

[B]: Horizontal Used Toner Transport Coil

Driven by the PTR motor, this transports used toner from the PCU used toner collection coils to the vertical used toner transport coil.

[C]: Vertical Used Toner Transport Coil

Driven by a parallel vertical shaft connected to the used toner bottle transport motor, this transports used toner from the horizontal used toner collection coil to the central collection point above the used toner bottle.

[D]: Diagonal Used Toner Transport Coil

Driven by the PTR motor, this transports used toner from the ITB unit and PTR unit used toner collection coils to the central collection point above the used toner bottle.

[E]: Used Toner Bottle Transport Coil

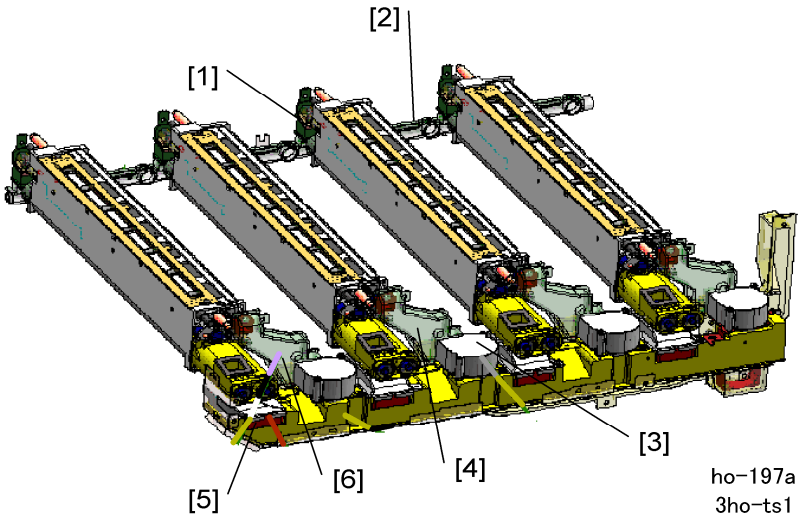
Driven by the used toner bottle transport motor, this transports used toner from the central collection point to entrance of the used toner bottle.

[F]: Used Toner Bottle Distribution Coil

This coil at the top of the used toner bottle is driven by the used toner bottle near full motor.

The coil distributes the used toner evenly across the length of the used toner bottle.

Excess Toner Collection Coils



1	Excess Developer Coil*1
2	Horizontal Used Toner Transport Coil
3	Cooling Fan 2 (Doctor Blade)*1
4	Cooling Duct 2 (Development Doctor Blade)*1
5	Cooling Fan 1 (Below Development Unit)
6	Cooling Duct 1 (Below Development Unit)
	*1 These are new items.

An excess developer coil has been added to each PCU in order to transport excess toner from the development unit.

Process Control

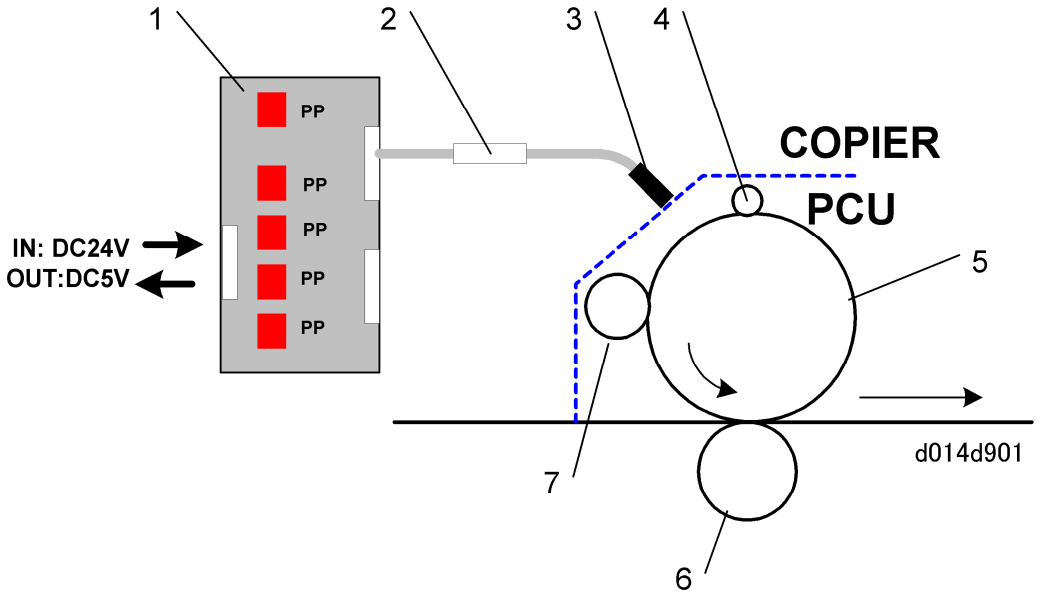
Overview of Process Control

In this machine, there are three phases in process control:

- **Potential control**. Adjusts the image creation process (charge, development bias, and LD power) to achieve the target toner coverage. During potential control, several series of patterns are created at prescribed times. The potential sensor and ID sensor read these patterns. The readings of these sensors are used to determine the development capacity (development gamma), and then adjust the conditions around the drum to reproduce the best possible images. Potential control also puts the machine in the best possible condition to begin toner supply control.
- **MUSIC**. MUSIC (Mirror Unit Skew Interval Correction) corrects the horizontal and vertical skewing of the print images on the ITB
- **Toner supply control**. Detects the amount of toner applied to ID sensor patterns between pages and adjusts the amount of toner supplied to the development unit to maintain consistency in the amount of toner.

Components Used During Process Control

Potential Sensor



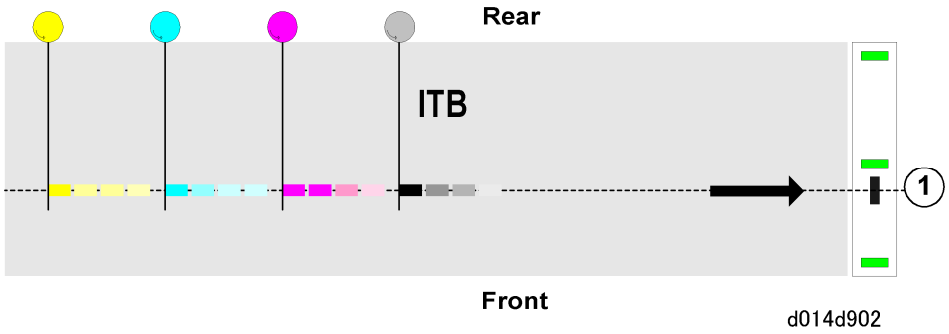
1	Potential Sensor PP	Max. output: -1000V
2	Drawer Connector	Connection point for PCU
3	Potential Sensor Probe	Mounted in the copier (not in PCU)
4	Charge Roller	Y,M,C PCU. K PCU has a corona unit.
5	OPC Drum	Surface potential: -900V max.
6	Transfer Roller	1.5kV (normal use), 5kV (transfer)
7	Development Roller	Range: -350 to -800V dc

There is a potential sensor mounted in the copier above the surface of the drum in each PCU. Each potential sensor consists of a probe and small power pack. A drawer connector connects the probe and the power pack as shown above.

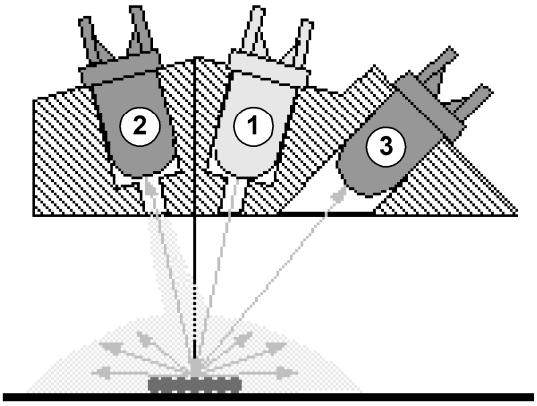
The potential sensor measures the potential of the drum immediately after it is charged by the charge rollers in the Y,M,C PCUs and charge corona unit in the K PCU. It also measures a series of patterns (undeveloped latent images) exposed on the drum by the laser diodes:

- A detector in the center of a very small window measures the strength of the electrostatic charge on the drum surface. The strengths of the charges vary, depending on the surface potential of the drum.
- A feedback circuit applies voltage to the probe until the strength of this charge equals (offsets) the strength of the charge on the drum.

ID Sensor



One ID sensor above the image transfer belt reads the K, M, C, and Y patterns on the belt.



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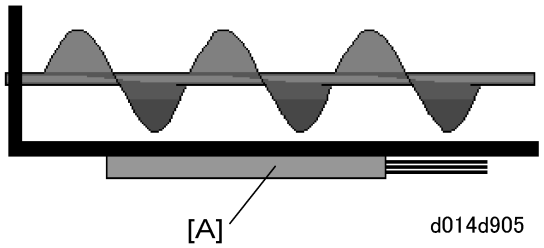
Three diodes comprise the ID sensor:

- **(1) Emitter**. Emits light on the patterns.
- **(2) Direct reflector sensor**. Gathers light reflected directly from the patterns.
- **(3) Diffused reflector**. Gathers diffuse light from the sides of the patterns to achieve more accurate readings especially for Y, M, C.

During process control, the creation of the patterns is timed so the Magenta, Cyan and Yellow patterns are transferred to the ITB at approximately the same time. The ID sensor reads the patterns in the order K, M, C, Y.

TD Sensor



d014d905

A TD sensor [A] is attached to the bottom of the development unit in each PCU.

The TD sensor directly measures the amount of toner in the developer/toner mixture. Unlike previous machines, this TD sensor is not in direct contact with the developer/toner mixture.

Vt is the output voltage of the TD sensor. When Vt goes high, toner is added to the developer

to bring Vt back to the Vtref value.

Temperature/Humidity Sensors

Two temperature/humidity sensors are used for process control. One is near the drum potential sensor above the M PCU, and one is below the used toner bottle.

K PCU Temperature/Humidity Sensor

The output of this sensor is used to:

- Set the level of the ac charge applied to each PCU
- Set the length of time the agitator in the development unit rotates to mix the developer and toner.

Used Toner Bottle Temperature/humidity sensor

The output of this sensor is used to control the amount of current applied to the image transfer belt and paper transfer roller. It is also used to correct fusing idling temperature during fusing temperature control.

List of Process Control Acronyms

The potential control phase of process control involves many adjustments. Here is list of acronyms used in the descriptions of process control adjustments.

Acronym	Description
Cdc	Charge dc bias
Vb	Development charge bias
Vb*1	Development charge bias after Vr (residual potential) adjustment
Vd	Drum potential after the drum is charged by the charge roller.
Vd*1	Drum potential after Vr (residual potential) adjustment
Vdhome	The electrical potential of the drum after a fixed dc bias (dc –700V) is applied by the drum charge roller.
Vdp	Development potential (Vb – Vpl). This is the ability to attract toner to the drum.
Vk	Development start voltage (checks the developer at the beginning of process control to determine whether it has deteriorated)
Vl	Light potential. Development potential of areas on the drum exposed by the laser diodes. Maximum laser power has been applied to the diodes.
Vpl	Electrical potential after laser exposure, with 24/63 of maximum laser power (power is controlled with PWM).
Vpl*[1]	Electrical potential (Vpl) after Vr (residual potential) adjustment
Vpp	Charge ac bias.
Vr	Residual potential
Vsg_dif	Vsg after checking the bare surface of the ITB by the diffused reflection sensor.
Vsg	ID sensor output after reading bare surface of the ITB
Vsg_reg	Vsg after checking the bare surface of the ITB by the direct reflection ID sensor.
Vsp	ID sensor output from the most recent ID sensor pattern.
Vt	TD sensor output at the present time.

Acronym	Description
Vtcnt	Gain value calculated during TD sensor initialization. This is used to adjust the Vt (TD sensor output). A large gain increases Vt, and a small gain decreases it. The result of this calculation is also used to calibrate Vt during TD sensor initialization.
Vtref	Target output of the TD sensor. The machine always tries to adjust the toner WT% in the developer to bring Vt closer to Vtref.

*[1] Adjustment done for each color Y, M, C, K

Important SP Codes Related to Process Control

This table lists the SP codes that are associated with the most important elements of process control. For more, please refer to "Service Tables".

		SP3501 001 Potential Control Type Selection		Target Effect in Process Control
0: Auto	1: Fixed			
Charge				
Charge dc bias	Cdc	SP3576	SP2201	Potential control
Charge ac bias	Vpp	SP3577	SP2202	Prevention of abnormal images
Exposure				
PM (LD power)	Ldp	SP3581	SP2211	Potential control
Development				
Development bias	Vb	SP3575	SP2212	Potential control

Potential Control

When is Potential Control Done?

1. Initial Process Control Self-Check

The process control self-check is always done automatically after the machine is turned on. If one or more of the following conditions existed before the machine is switched off, this will also trigger the process control self-check:

- The machine remained idle longer than the time specified with SP3554-1.
- The temperature change since the previous time that the machine power was cycled off/on was greater than the setting specified with SP3554-2.
- The change in the relative humidity since the previous time that the machine power was cycled off/on was greater than the value specified for SP3554-3.
- The change in the absolute humidity since the previous time that the machine power was cycled off/on was greater than the value specified for SP3554-4.

Note: The initial process control self-check is not done when the machine is turned on with the front door open.

2. During a Job.

SP3552 determines when a process control self-check is done while the machine is printing, receiving data for the next job, or while jobs are queued for printing. This occurs when:

- The current page count for black-and white (SP3552-3) > SP3552-1
- The current page count for color (SP3552-4) > SP3552-2

If SP3552-1, -2 are set to "0", the self-check is done at the following intervals, which depend on the development gamma from the most recent process control self-check.

- If the development gamma reading is much larger than the target value of development gamma, the process control self-check is done every 250 pages.
- If the development gamma reading is only slightly different from the target value of development gamma, the process control self-check is done every 500 pages.

3. At Job End

There are separate counters for black-and-white and color pages. SP3551 sets the number of pages that will trigger a process control self-check at the end of a job. SP3552 sets the number of pages that will trigger a process control self-check during a job and not wait for job end.

- Black and White: If the current page count (SP3551-3) > SP3551-1, process control will be done at the end of the job, if end-of-job process control has not been done for 250 pages
- Color: If the current page count (SP3551-4) > SP3551-2, process control will be done at the end of the job, if end-of-job process control has not been done for 250 pages

SP3551-3 or SP3551-4 can be set to "0" to disable this feature.

4. After a Specified Idle Time.

The machine will execute the process control self-check if the machine remains idle for the length of time specified by SP3555. After the time set with SP3540-2 has elapsed, the current temperature and humidity are compared with the temperature and humidity the last time the drum stopped. If the difference is greater than the threshold values set with this SP3555, initial process control executes. Specifically, this means this SP will trigger the self-check under the following conditions:

- The machine has not been used within a specified length of time since the last process control self-check (SP3555-1).
- Change in ambient temperature (SP3555-2).
- Change in relative humidity (SP3555-3)
- Change in absolute humidity (SP3555-4)

5. Before ACC (Automatic Color Calibration)

The process control self-check is done after touching [Execute] on the operation panel to start ACC and just before the ACC pattern prints. However, this operation can be changed with SP3501 004:

0	Process control self-check is not done before the ACC pattern prints.
1	A partial self-check (only potential control) is done before the ACC pattern prints. This takes about 10 seconds.
2	The full process control self-check (potential control and toner density control) is done before the ACC pattern prints (default). This takes between 10 seconds and 180 seconds.

6. Immediately after TD sensor Initialization.

The process control self-check is done automatically every time a TD sensor is initialized.

- Done after SP3801 001-006 is executed (after replacing the developer).
- Done after SP3811 is executed (at machine installation, or after replacing developer).

7. Potential control process control self-check

This is done manually by the service technician or designer with SP3820-1.

8. Potential control/toner density adjustment process control self-check.

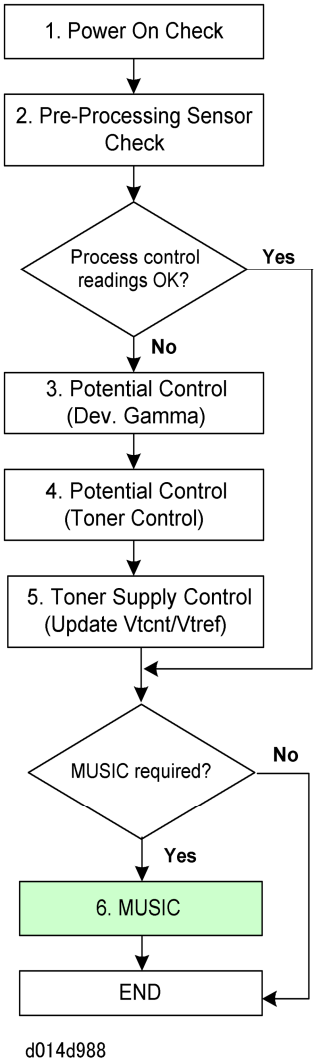
This is done with SP3820-2. This SP must be done manually when only the drum is replaced (but not developer).

What is Done During Potential Control?

The process described below is done in each of the four PCUs. For simplicity, however, the discussions are limited to what occurs in one PCU. The illustration below shows the sequence of events during process control and MUSIC adjustment.

Note that the sensor readings used by both potential control and MUSIC adjustments are always checked at Step 1 and 2 before MUSIC executes. For example, if only MUSIC is to be updated:

- The readings are checked at Step 2.
- If the process control readings are within range, MUSIC executes.
- If the process control readings are not within range, Steps 3, 5, 6 are done then the process loops back to Step 1.
- After the new readings are done at Step 2, then MUSIC is done.



1. Check after Power On

This check is performed only after the machine is powered on.

- AC Current Adjustment.
  The machine selects the current for optimum AC charge (Vpp). The optimum charge depends on the ambient temperature and humidity. The optimum charge for each temperature and humidity range is set with SP2204 (ACC Charge Correction). Insufficient charge can cause white spotting, and too much charge can cause toner film on the surface of the drum. This check ensures that the average value of Vpp after 20 samplings is Vpp > 2.8 kV.
- Toner Agitation

- Vsg detection. The ID sensor detects Vsg (reflectivity of the bare drum surface)
- Transfer current adjustment.

2. Check Sensor Readings

The processes and analyzes the results of the sensor readings in the previous step.

- Detect Vdhome

  A charge of –700V is applied to the drum. The potential sensor detects the potential of the drum and checks if the potential sensor, drum, and charge roller/corona unit are functioning normally. If the charge is within the range –800V to –500V, the drum is functioning normally.

  Possible Errors at Potential Sensor Calibration

SC Codes	For More Details:
SC436~SC439	See "Process Control Troubleshooting" in "4. Troubleshooting" in the Venus-C1 (B132/B200) Service Manual.
SP3821	15, 16, 17

- Vsg adjustment

  Before the gradated patterns are read, the strength of the ID sensor output (LED PWM) is adjusted to bring the value of Vsg_reg to the specified value.

  An abnormal condition is detected when:

  - Before Vsg adjustment begins, Vsg_reg < 0.5V
  - After Vsg adjustment, Vsg_reg cannot be adjusted to 4.0±0.2V

  Possible Errors at Vsg Adjustment

SC Codes	For More Details:
SC400, SC418	See "Process Control Troubleshooting" in "4. Troubleshooting" in the Venus-C1 (B132/B200) Service Manual.
SP3821	21, 22, 23

- Transfer current adjustment error

  Possible Errors with Transfer Current Adjustment

SC Codes	For More Details:
SC465 to SC472	See "Process Control Troubleshooting" in "4. Troubleshooting" in the B132/B200 Service Manual.

3. Potential Control (Development Gamma Measurement)

The laser diodes write the 4-grade potential sensor patterns on each drum. To make the different densities, the machine changes the PWM duty of the laser diodes.

- Potential sensor reads the 4-grade patterns on the image transfer belt. The required potentials are calculated.
- ID sensor reads the patterns 4-grade patterns on the image transfer belt to calculate the amount of toner coverage required.
- The combined readings of the potential sensor and ID sensor are used to retrieve from a lookup table the optimum values for:

  1) Vd (charge potential)

  2) Vb (development bias)

  3) Vpl (drum potential after exposure)

  The development gamma must be in the range 0.3 to 6.0 V. Development start voltage (Vk) must be in the range –150 to 150 V. This development start voltage is used to indicate whether the developer has deteriorated. However, this is only a rough measurement that can be affected by ambient conditions and the condition of other electrical components.

  Possible Errors at ID Sensor Pattern Detection

SC Codes	For More Details:
SC410~SC413	See "Process Control Troubleshooting" in "4. Troubleshooting" in the Venus-C1 (B132/B200) Service Manual.
SC414~SC417	
SP3821	55, 56, 57, 58, 59, 60

4. MUSIC

The MUSIC adjustments are done only if the process control readings are within the prescribed ranges.

5. Potential Control (Toner Application Control)

- Adjustment is done for residual potential. The laser unit fires at full power to compensate for a possible high residual potential on the drum. Next, the amount of residual potential is detected, and the charge is adjusted to achieve the target potential. The detected Vr must be less than –200V.
- Using the values retrieved from the lookup table in Step 3 above, Vd, Vb, and Vpl are updated to Vd*, Vb*, and Vpl*

  1) Vb*: Targeted development Bias after Vr correction

  2) Vd*: Target drum potential after Vr correction

  3) Vpl*: Target electrical potential after Vr correction

  Possible Errors at Vr (Residual Potential) Adjustment

SC Codes	For More Details:
SC432~SC435	See "Process Control Troubleshooting" in "4. Troubleshooting" in the Venus-C1 (B132/B200) Service Manual.
SP3821	62

Possible Errors at Vd (Development Bias) Adjustment

SC Codes	For More Details:
SC420~SC423	See "Process Control Troubleshooting" in "4. Troubleshooting" in the Venus-C1 (B132/B200) Service Manual.
SP3821	63

Possible Errors at Vpl (LD Power) Adjustment

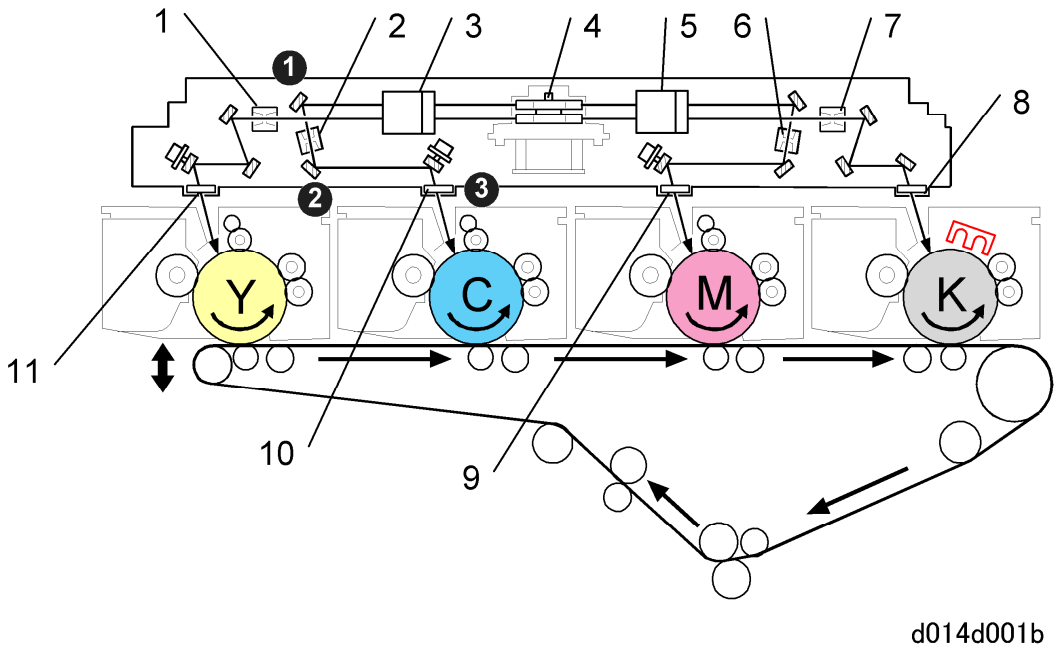
SC Codes	For More Details:
SC424~SC427	See "Process Control Troubleshooting" in "4. Troubleshooting" in the Venus-C1 (B132/B200) Service Manual.
SP3821	64

6. Toner Supply Control (Update Vtcnt/Vtref)

Now the machine can use the values calculated during process control to calibrate Vtref and Vtcnt in order to supply the correct amount of toner. There are no checks for abnormal conditions at this step.

MUSIC (Mirror Unit for Skew and Interval Correction)

The Optical Path



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1. WTL Lens (Y)
2. WTL Lens (C)
3. Dual-layer f-theta Lens (C, Y)
4. Polygon Mirror Motor
5. Dual-layer f-theta Lens (M, K)
6. WTL Lens (M)
7. WTL Lens (K)
8. Dust-shield Glass
9. Dust-shield Glass
10. Dust-shield Glass
11. Dust-shield Glass

Optical Path

All four latent images (C, M, Y, K) are written at approximately the same time. The laser diode turn-on times for each color are timed with drum rotation and paper feed. Refer to the illustration on the previous page. The optical path for each color is as follows:

Cylindrical lens (laser beam correction in each LD unit)	(Not shown)
↓	
Polygon mirror (main scanning line)	4
↓	
Fθ lens (dot position correction)	3
↓	
1st Mirror	1
↓	
WTL lens (surface distortion correction)	2
↓	
2nd Mirror	2
↓	
3rd Mirror	3
↓	
Dust-shield Glass	10
↓	
Drum	

Each f-theta lens has two layers. Because of this, it can correct both beams from the LD units. Each WTL lens corrects for image distortion.

The polygon mirror turns at high speed. The laser beams are reflected from the polygon mirror to a pair of mirrors (upper and lower), then to one more mirror and out to the drum through the dust-shield glass. The polygon mirror has six faces.

The polygon mirror motor rotates at 33,307 (V-C2a) or 41,669 (V-C2b) rpm for full-color and for black-and-white copying.

Important

- Because of its high rotation speed, the mirror continues to turn for about 3 minutes after the machine is turned off. Allow enough time for the mirror to stop before you start to remove the polygon motor.

What does MUSIC do?

MUSIC is the Mirror Unit for Skew and Interval Correction. Three MUSIC sensors above the ITB read three MUSIC sensor patterns made by the machine on the ITB.

The machine uses the results to adjust:

- The machine adjusts the start timing for the laser at the start of the main scan. This adjusts the main scan. If skew is detected in the main scan direction, the machine adjusts the laser timing and the angles of the 3rd mirrors (Y, M, and C only).
- The speed of the drum motors to correct the intervals between the patterns. This adjusts the sub scan.

If the vertical alignment of the patterns is not correct, or if the intervals are not correct, this causes color registration errors.

The MUSIC adjustment is done for each color (Y, M, C, K).

When is MUSIC done?

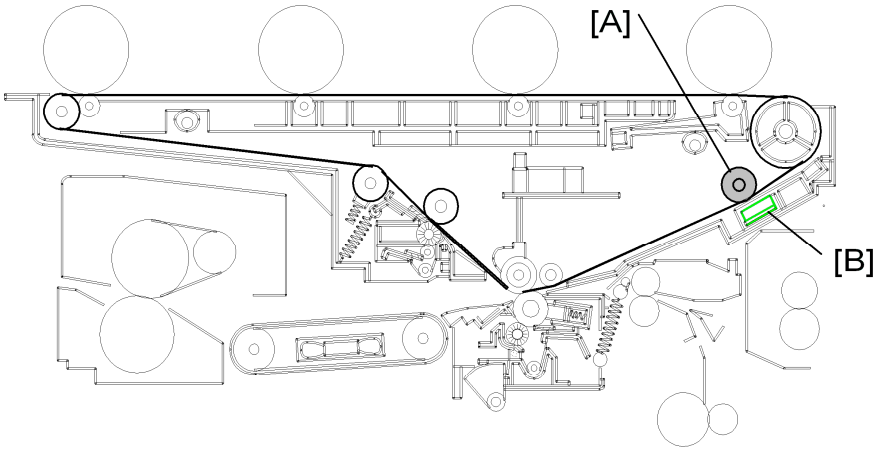
Normally, MUSIC executes automatically:

- Immediately after the machine is turned on or returns from an energy save mode.
- At the start of a job, if the temperature in the laser exposure unit changed since the end of the job by the amount set with SP2153 020 (Default: 1.5°C)
- After process control (enable/disable with SP2153 002).
- Every 100 pages during a long color job (you can change the interval with SP2153 024) if the temperature in the laser exposure unit has changed since the end of the most recent MUSIC adjustment by the amount set with SP2153 020 (Default: 1.5°C)
- Forced MUSIC (manually by the user or a technician)
  1) User Tools> Maintenance> Color Registration
  2) SP 2111 001

Here are some important points to remember about MUSIC:

- Immediately after the machine is turned on, MUSIC requires time to complete processing. But you can do a black-and-white job immediately.
- If a job is started before the MUSIC process has completed, a message ("Now Self Checking") will appear on the operation panel display.
- The job will not be done until the MUSIC process is finished. Wait for MUSIC to complete.

Location of the MUSIC Sensors



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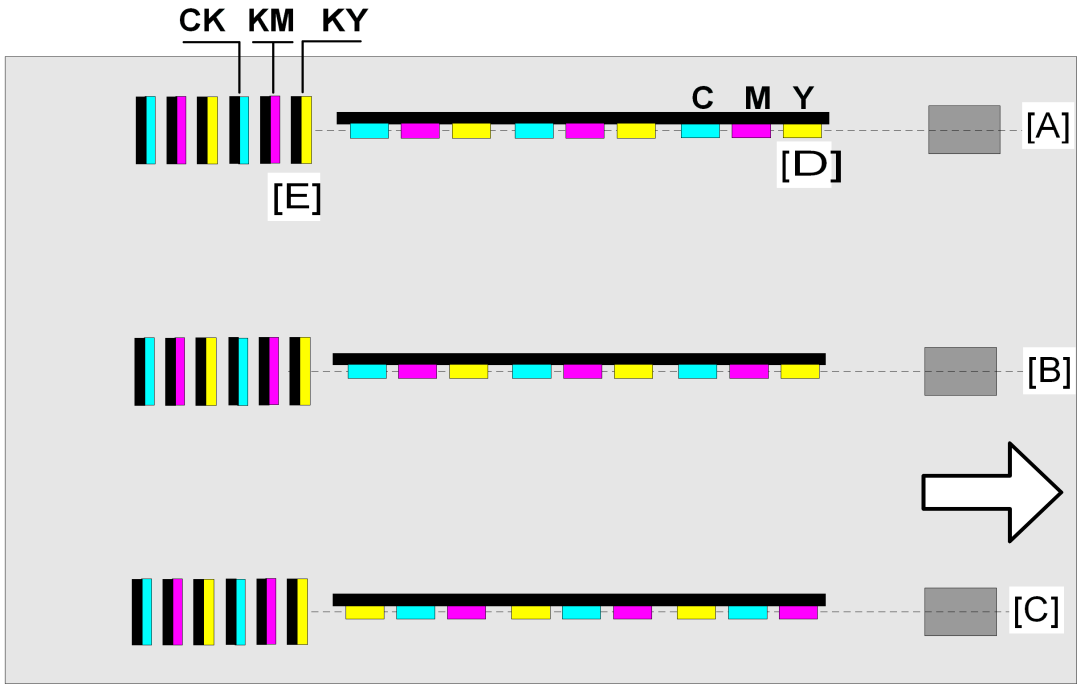
The three MUSIC sensors [A] are arranged in a straight line below the ITB.

A roller [B] opposite the sensors pushes the transfer belt against these sensors. This ensures that the sensors read the patterns accurately.

How is MUSIC Done?



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[A]: Rear MUSIC sensor

[B]: Center MUSIC sensor

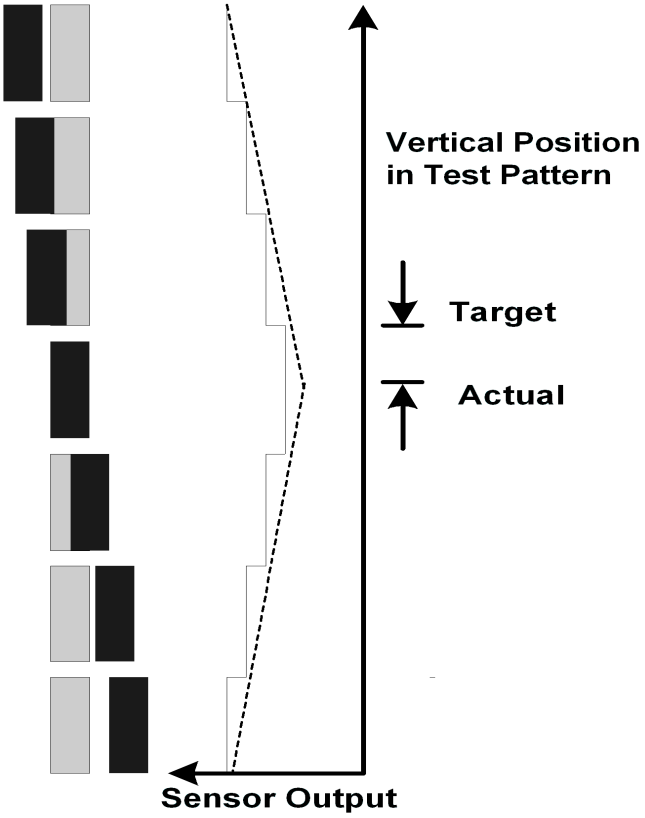
[C]: Front MUSIC sensor

[D]: Main scan MUSIC patterns

[E]: Sub scan MUSIC patterns

The MUSIC sensors [A], [B], and [C] read the MUSIC patterns from the ITB.

The main scan MUSIC sensor pattern [D] consists of patches for each color (M, C, Y) beside the black (K) color patch. The sub scan MUSIC sensor pattern [E] consists of patches for each color (M, C, Y) above a black (K) patch.



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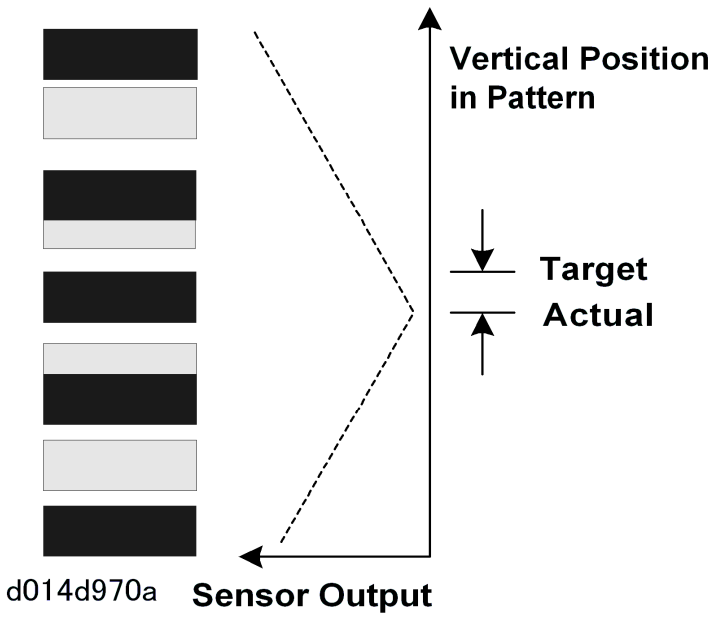
This diagram shows a close-up view of the main-scan test pattern.

K is the reference, and the positions of CMY are adjusted with reference to the K pattern.

The CMY patterns are vertical (shown in grey in the diagram), but the K pattern overlaps the CMY patterns as shown.

The MUSIC sensor response is measured. The output is the lowest when the K pattern fully overlaps the color pattern (the dotted lines in the diagram cross at this point). This is the "Actual" position as shown in the diagram. But there is a "Target" value in the machine software (an example is shown in the diagram; this is not the real target, it is just an example to explain the process). The machine compares the "Actual" and "Target" values, and adjusts the laser timing in response to the results of this comparison.

Skew is also measured in the main scan direction using the patterns at the left and right of the ITB. If skew is detected, the machine adjusts the angle of the 3rd mirrors.



This diagram shows a close-up view of the sub-scan test pattern.

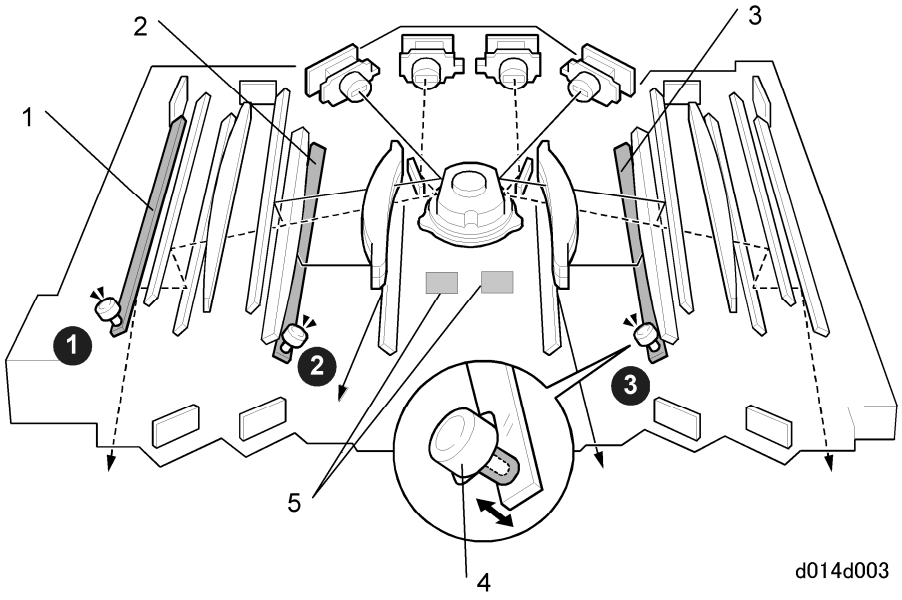
K is the reference, and the positions of CMY are adjusted with reference to the K pattern.

The CMY patterns are at constant intervals, but the K pattern overlaps the CMY patterns as shown.

The MUSIC sensor response is measured.

The output is lowest when the K pattern fully overlaps the color pattern (the dotted lines in the diagram cross at this point). This is the "Actual" position as shown in the diagram. But there is a "Target" value in the machine software (an example is shown on the diagram; this is not the real target, it is just an example to explain the process). The machine compares the "Actual" and "Target" values, and adjusts the speeds of the drum motors (Y, M, C) according to the results of this comparison.

3rd Mirror Position Adjustment



1. 3rd Mirror (Y)
2. 3rd Mirror (C)
3. 3rd Mirror (M)
4. Mirror Adjustment Motors ①②③
5. Temperature Sensors

Each color Yellow [1], Cyan [2], Magenta [3] has a mirror. The machine uses the mirror motors (①②③) to adjust the position of each mirror to correct color registration errors on the ITB in the main scan direction. Color registration errors occur if all four color-toner images do not cover each other exactly on the ITB.

The 3rd mirror for black (K) does not have an adjustment motor. (The position of black toner on the ITB is used as a reference point to adjust the positions of the other colors.)

Exposure Unit Temperature Sensors

There are temperature sensors [5] near the f-theta lenses to monitor the temperature inside the exposure unit.

The f-theta lenses are made of plastic. The magnification ratio of plastic lenses may vary slightly with temperature. The CPU uses the feedback from these temperature sensors to adjust the mirror positions during MUSIC calibration. This corrects color registration errors on the ITB.

Toner Supply Control

Overview

The toner supply method can be selected with SP3301-1 to 4.

- 0: Fixed supply mode (used for testing only; do not use this mode except during some troubleshooting procedures as described in section 4)
- 1: PID (Proportional Integral Differentiation) control mode (default)

This section describes only PID control because only PID control is used in the field. PID control uses inputs from pixel count, and from the TD and ID sensors. If the TD or ID sensor is broken, the machine uses PID control with inputs from pixel count only.

The following three functions comprise toner supply control for this machine.

1. At the end of every job (at the same time as potential control)

This is done if the number of pages since the previous toner supply control is more than the number that is set with SP 3551.

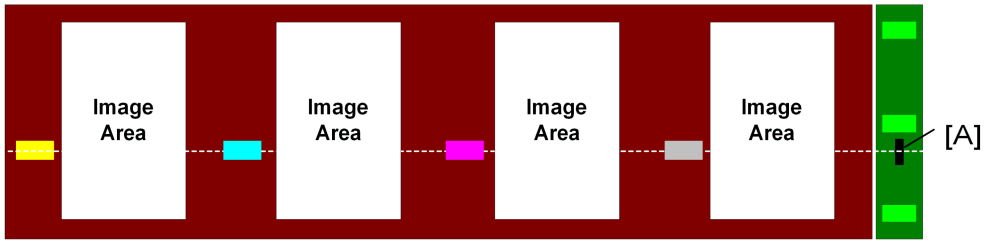
Black-and-white	After 250 pages (adjustable with SP3551 001)
Full color	After 250 pages (adjustable with SP3551 002)

Using the development gamma that was calculated during potential control, the machine determines the target amount of toner (M/A):

- Low development gamma: Raises the target image density of the sensor pattern and increases the toner concentration.
- High development gamma: Lowers the target image density of the sensor pattern and decreases the toner concentration.

2. Page interval process control (Vsp detection between pages)

This function operates only when SP3042 001 (Vtref correction) is set to "ON" (default). The Vsp ID sensor pattern is created between the page images on the ITB (Default: Every 10 pages). This interval can be adjusted with SP3102.



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The toner M/A is calculated from readings of the ID sensor patterns by the ID sensor after every 10th page. The maximum coverage (Target M/A) that can be achieved by the process control self-check is controlled by SP3531-1, 2, 3, 4.

Toner supply is based on Vt - Vtref

- If the pattern is too dark (too much toner):
  > Vtref is increased > Toner supply amount decreases
- If the pattern is too light (not enough toner):
  > Vtref is reduced > Toner supply amount increases
- TD sensor detection is also done for every page:
  If Vt < Vtref, the toner supply amount is lowered.
  If Vt > Vtref, the toner supply amount is raised.

Toner Supply Operation Flow

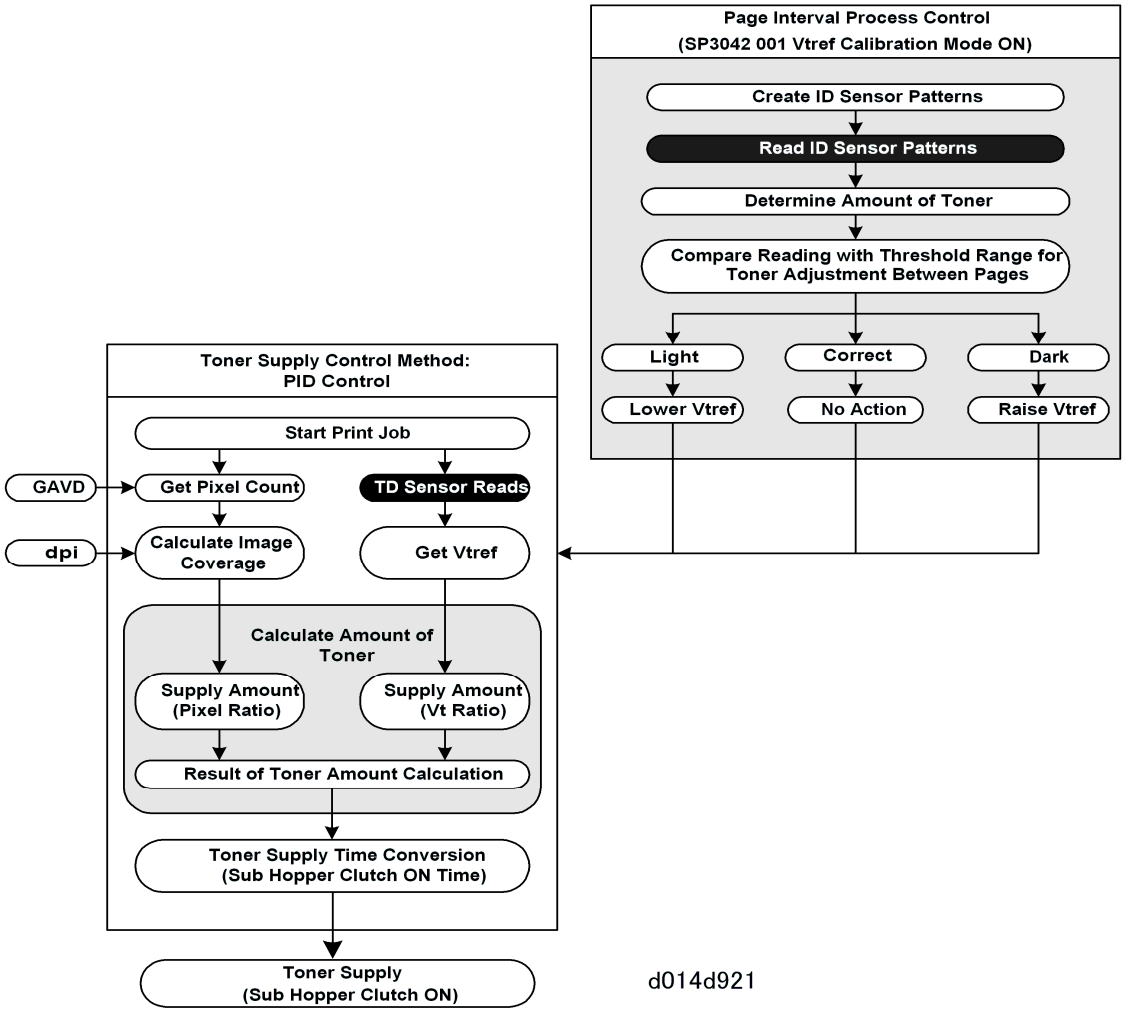
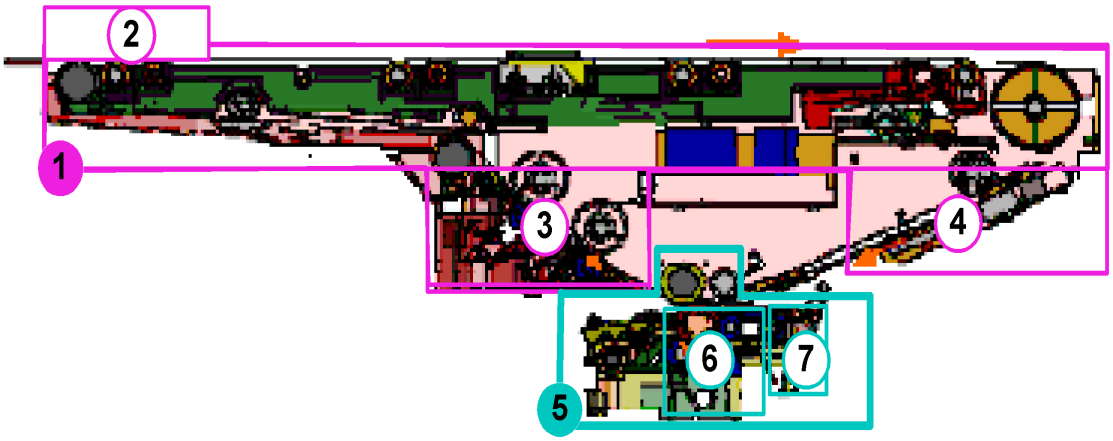


Image Transfer

Image Transfer Overview



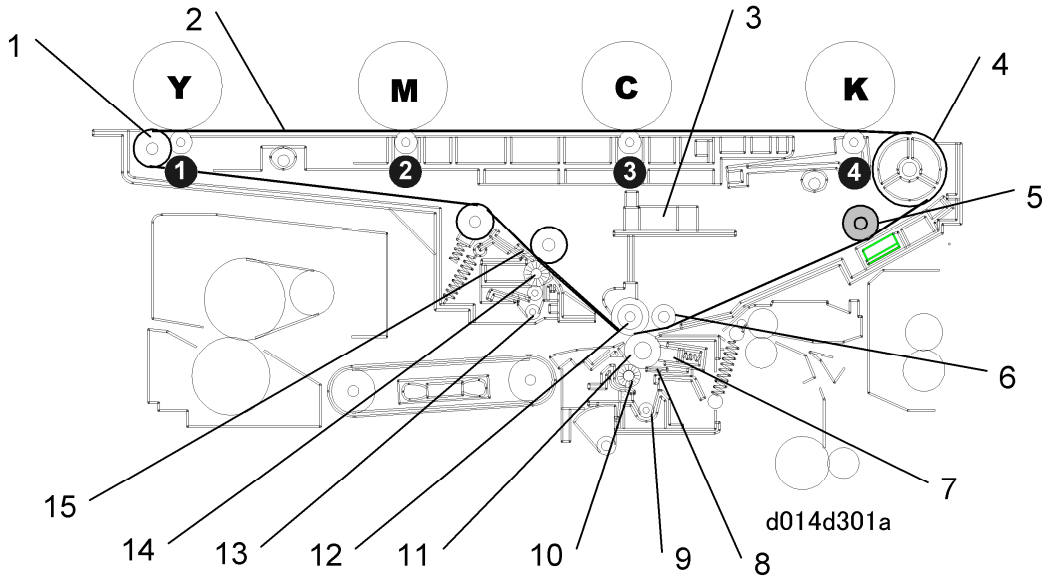
temp_itu

The image transfer unit performs two important functions: transferring the image from the OPC drum to the ITB (Image Transfer Belt) and transferring the image from the ITB to paper. The image drum-to-belt transfer is done in the ITB unit ① at the top. The belt-to-paper transfer is done in the PTR (Paper Transfer Roller) unit ⑤ at the bottom.

The ITB unit ① contains a lift mechanism ②, a cleaning unit ③, and a MUSIC sensor unit ④. The ITB lift mechanism raises the ITB against the bottoms of the color drums above during full-color printing and lowers the ITB for black printing and when the machine is idle. The cleaning unit cleans the ITB. The MUSIC unit contains sensors that read the MUSIC and ID sensor patterns on the belt.

The PTR unit ⑤ contains a cleaning mechanism ⑥ and a lift mechanism ⑦. The cleaning mechanism cleans the PTR. The lift mechanism raises the PTR against the belt, paper, and the opposing roller above when the image is transferred from belt to paper and lowers the roller when the machine is idle.

These mechanisms are described in more detail below.



1. Image Transfer Rollers (①, ②, ③, ④)
2. Image Transfer Belt (ITB)
3. Transfer Power Pack
4. ITB Drive Roller
5. ID/MUSIC Sensor Roller
6. Belt Pressure Roller
7. PTR Lubricant Bar
8. PTR Cleaning Blade
9. PTR Toner Collection Coil
10. PTR Cleaning Brush
11. PTR (Paper Transfer Roller)
12. ITB Bias Roller
13. ITB Toner Collection Coil
14. ITB Cleaning Brush Roller
15. ITB Cleaning Blade

1. Image Transfer Rollers (①, ②, ③, ④)

The positive charge applied by the transfer power pack to these sponge rollers (one for each PCU) pulls the developed images from the drums down onto the ITB.

2. ITB

Receives the toner images from the four drums and holds them until they are transferred to paper. During a full-color job, all the drums (Y, C, M, K) are in contact with the ITB. During a black-and-white job where only black is used, the ITB is lowered and the Y, C, M drums separate from the ITB, and only the black (K) drum contacts the ITB.

3. Transfer Power Pack

Applies the positive bias to the image transfer rollers that pull the developed toner images off the OPC drums and onto the ITB. This power pack also applies to the ITB bias roller the negative bias that pushes the images off the ITB and onto the paper.

4. ITB Drive Roller

Driven by the ITB drive motor, the ITB drive roller turns the ITB belt.

5. ID/MUSIC Sensor Roller

This idle roller opposes the ID sensor and three MUSIC sensors. It ensures that the belt is positioned close enough to the sensors for accurate readings of the ID sensor patterns and MUSIC patterns on the ITB.

6. Belt Pressure Roller

Presses down on the ITB and paper to hold them in place as the belt and paper enter the nip between the PTR and PTR idle roller where the images are transferred from the ITB to paper.

7. PTR Lubricant Bar

Lubricates the PTR to facilitate cleaning.

8. PTR Cleaning Blade

Removes any residual toner from the PTR after the PTR cleaning brush roller has cleaned the PTR.

9. PTR Toner Collection Coil

Used toner removed from the PTR by the PTR cleaning brush roller and PTR cleaning blade falls into the rotating coils. This toner is then moved to the transverse used toner collection coil and finally to the used toner bottle.

10. PTR Cleaning Brush

Removes residual toner from the PTR after the image is transferred from the ITB to paper.

11. PTR (Paper Transfer Roller)

Located below the ITB bias roller, the PTR applies pressure to the belt and paper when the image is transferred from belt to paper.

12. ITB Bias Roller

The transfer power pack applies a negative charge to ITB bias roller to push the negatively-charged toner image off the ITB onto the paper.

13. ITB Toner Collection Coil

Used toner removed from the ITB by the cleaning brush roller and ITB cleaning blade falls into the rotating coils. It is then moved to the transverse used toner collection coil and finally to the used toner bottle.

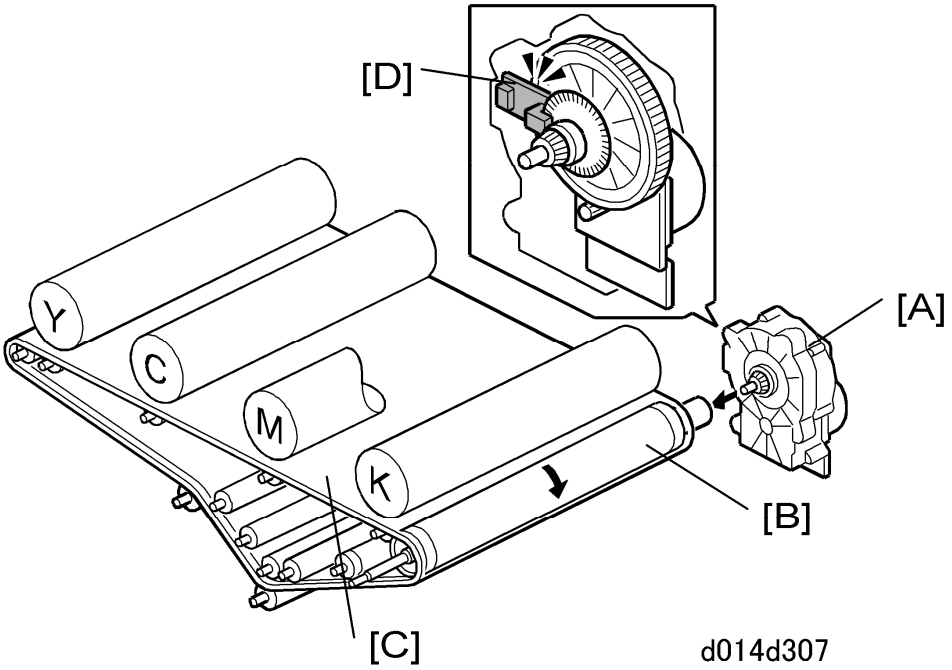
14. ITB Cleaning Brush Roller

Removes residual toner from the ITB after the image is transferred from the ITB to paper.

15. ITB Cleaning Blade

Removes residual toner from the belt after the ITB cleaning brush roller cleans the belt.

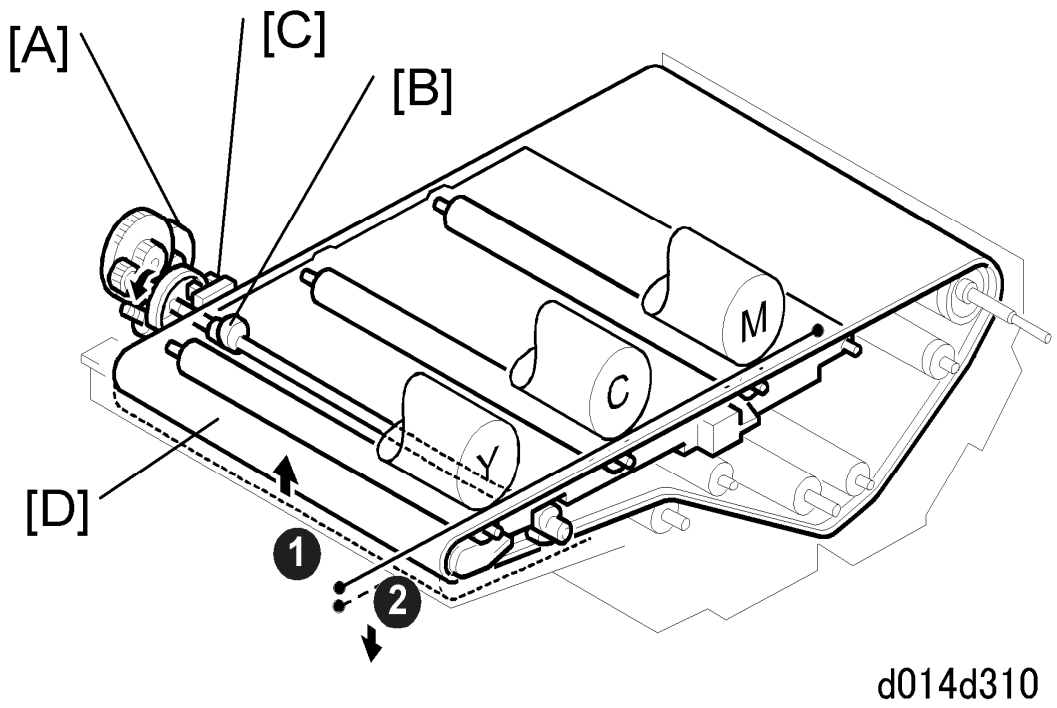
ITB Drive



[A]: ITB drive motor
[B]: ITB drive roller
[C]: ITB
[D]: ITB Motor Encoder

The ITB drive motor [A] drives the ITB drive roller [B]. The ITB drive roller rotates the ITB [C].
Other rollers inside the ITB are idle rollers.
The ITB motor encoder [D] (inside the ITB motor unit) controls the operation of the ITB motor.

ITB Lift



[A]	ITB lift motor
[B]	ITB lift cam
[C]	ITB lift sensor
[D]	ITB
①	FC (Full Color) position (up)
②	K (Black only) position (down)

The ITB lift motor [A] (a stepper motor) turns the ITB lift cam [B]. This cam lifts and lowers the ITB [C]. The operation of the ITB lift motor is controlled by the ITB lift sensor [D]. When the machine is turned on, the ITB stays at position [E]. The Y, C, M drums are separated from the ITB.

When Full Color Mode is Selected:

- The motor turns the cam until the actuator goes into the ITB lift sensor.
- The motor stops.

- The raised cam holds the ITB at position [F]. All drums (Y, C, M, K) contact the ITB.
- The machine automatically adjusts the paper feed timing for full color copying with all the drums.
- While the Y, M, C drums are separated from the ITB, they do not turn. This reduces wear on these drums while they are not being used.

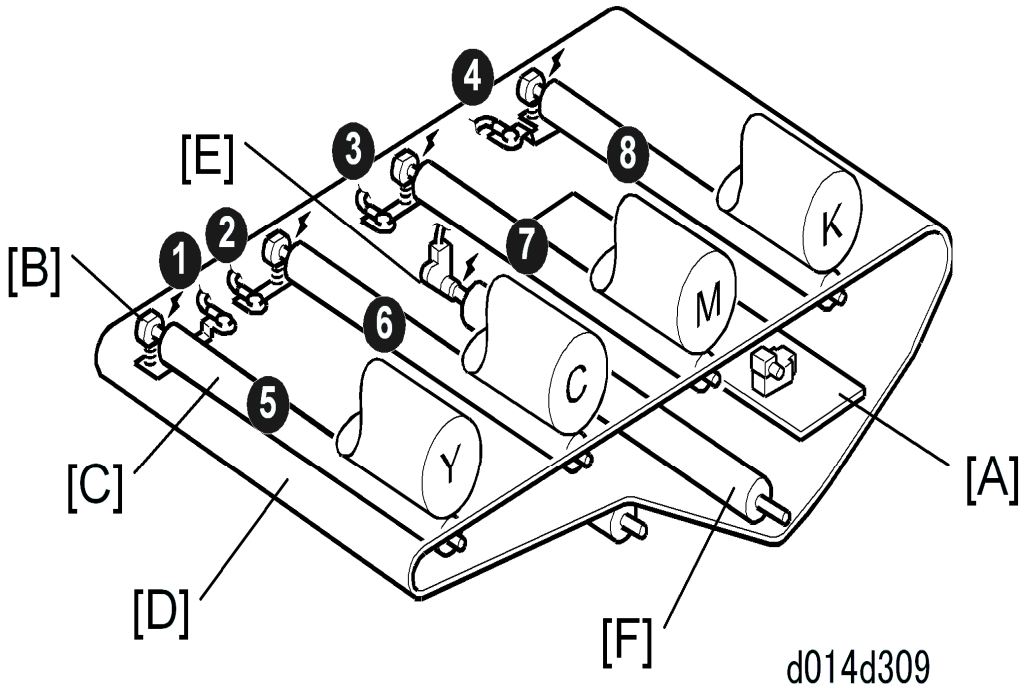
When Black-and-White Mode is Selected:

- The motor turns the cam until the actuator goes out of the ITB lift sensor.
- The motor stops.
- With the left side of the ITB down, only the black (K) drum contacts the ITB.
- The machine automatically adjusts paper feed timing for black-and-white copying with only one drum.
- The ITB stays down until the next full-color job starts

When ACS Mode is Selected:

- If the job has color pages and black-and-white pages, the ITB operation is controlled by SP 5880-1.
- The default is 0 (low productivity). In this mode, the ITB changes position each time the page type changes. This makes printing slower, but decreases wear on the color PCUs.
- If you set the SP to 1, then the machine will not move away from the color PCUs if a black-and-white page is next. This makes printing faster, but increases wear on the color PCUs.

Transfer Power Pack



[A]	Transfer power pack
[B]	ITB transfer roller terminals ①, ②, ③, ④
[C]	Image transfer rollers ⑤, ⑥, ⑦, ⑧
[D]	ITB
[E]	ITB bias roller terminal
[F]	ITB bias roller

To transfer the images from drum to ITB:

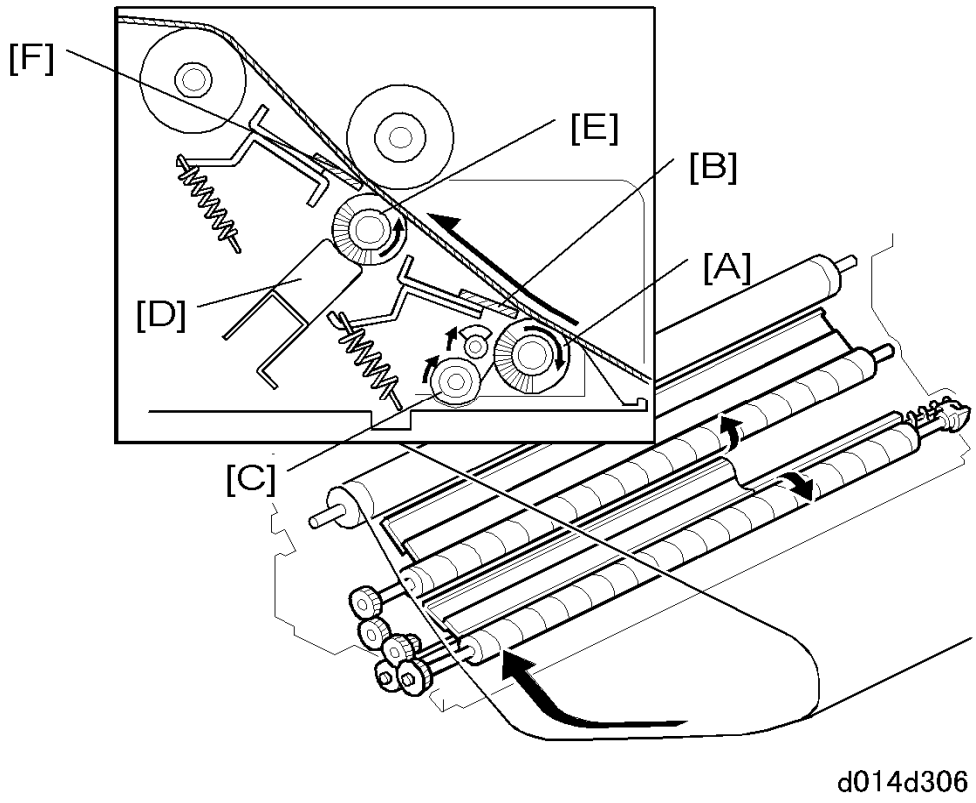
- The transfer power pack [A] supplies a positive charge (1 kV 24 to 30 muA) to the image transfer roller terminals [B] ①, ②, ③, ④
- The four terminals charge the image transfer rollers [C] ⑤, ⑥, ⑦, ⑧ which transfer the charge to the back of the ITB [D].
- The positively charged ITB pulls the negatively charged toner off the drums and onto the ITB.

To transfer the images from ITB to paper:

- The transfer power pack [A] supplies a negative charge to the ITB bias roller terminal [E].
- The terminal applies the negative charge to the ITB bias roller [F].
- The high negative charge of the ITB bias roller is applied to the back of the ITB. This repulses the low negative charge of the toner, forcing the images onto the paper.

The transfer power pack supplies the positive charge for image transfer to the ITB and the negative charge for image transfer from the ITB to paper. A temperature/humidity sensor under the used toner bottle motor controls the amount of the charge applied to the image transfer and ITB bias rollers.

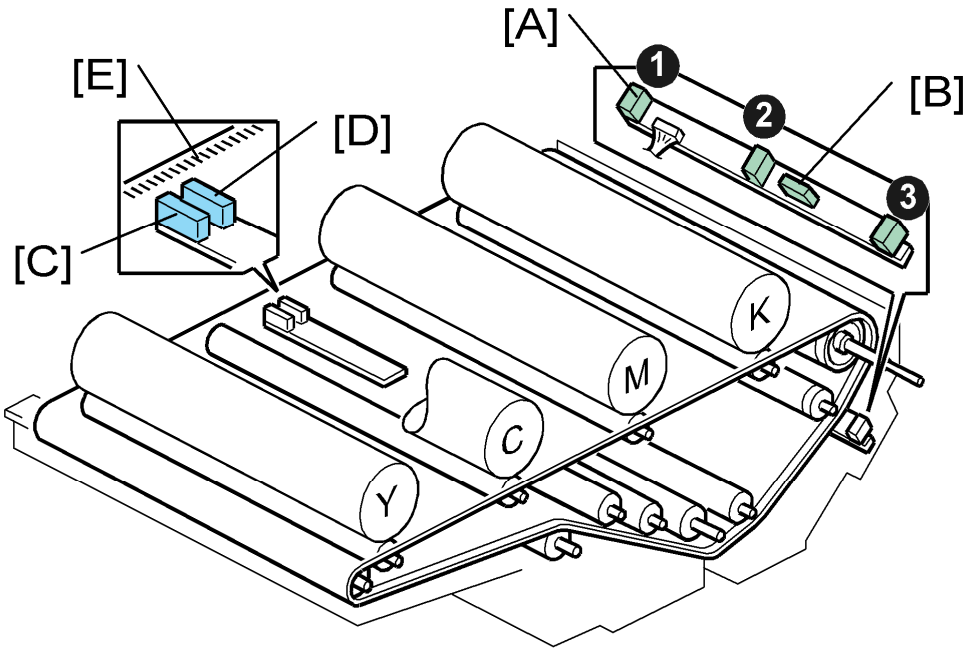
ITB Cleaning



[A]	ITB brush cleaning roller
[B]	ITB cleaning blade
[C]	Toner collection coil
[D]	Lubrication Bar
[E]	Lubricant Brush Roller
[F]	Lubricant Blade

The PTR motor rotates the ITB brush cleaning roller [A] against the bottom of the ITB as it passes above. The ITB cleaning blade [B] scrapes off any toner remaining on the belt after brush roller cleaning.
Toner removed by the brush cleaning roller and cleaning blade falls into the toner collection coil [C] that sends the used toner to the transverse toner collection coil at the back of the machine.
The lubrication bar [D] (ZnSt) lubricates the brush roller [E]. The lubricant brush roller lubricates the ITB to prevent scratching or scouring of the belt surface.
Finally, the lubricant blade [F] (ZnSt) removes any toner remaining on the lubricant brush roller.

ITB Speed Control



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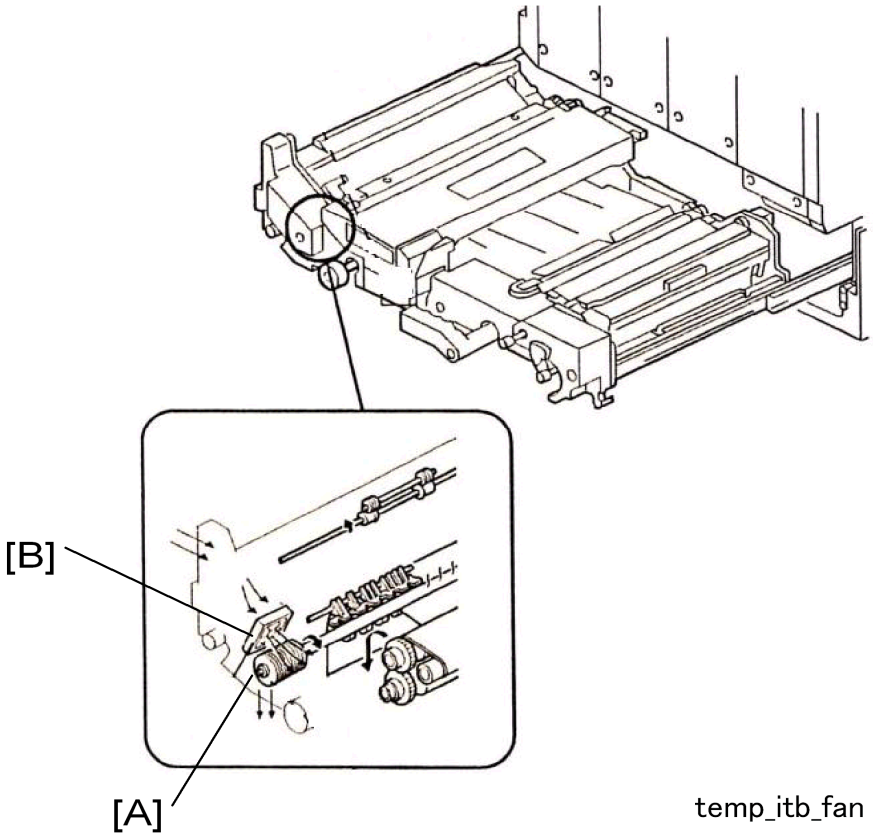
[A]	MUSIC sensors ①, ②, ③
[B]	ID Sensor
[C]	ITB position sensor 2 (Sub)
[D]	ITB position sensor 1 (Main)
[E]	ITB encoder strip

The feedback of three MUSIC sensors [A] control the speed of the drum motor to prevent color registration errors during full color printing.
There are two ITB position sensors Sensor 1 [C] and Sensor 2 [D] above the encoder strip scale [E] on the rear edge of the ITB.

- ITB position sensor 1 monitors the belt speed. The CPU uses this information to adjust the speed of the belt to account for eccentricity of the image transfer roller, differences in the thickness of the belt, belt slippage, and the load placed on the ITB by friction between the rollers at paper transfer.
- ITB position sensor 2, located a short distance from sensor 1, ensures that the number of gradations on the edge of the ITB in the gap between the sensors remains constant. This detects stretching or shrinking of the belt, and the ITB drive motor speed is adjusted to compensate for this occurrence.

ITB Ventilation

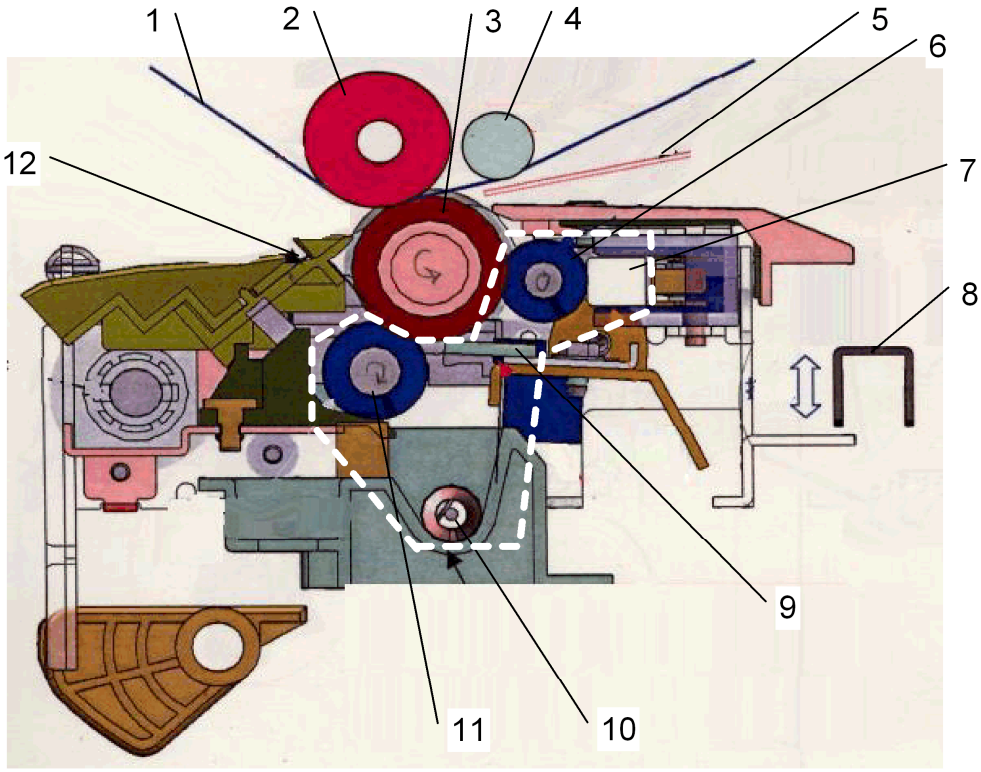


temp_itb_fan

Baffled fins [A] collect heat conducted from inside the ITB unit by the heat sink. The image transfer fan [B] draws in cool air and blows air through the fins to dissipate the heat and send it out of the ITB unit.

Paper Transfer

Paper Transfer Unit Overview

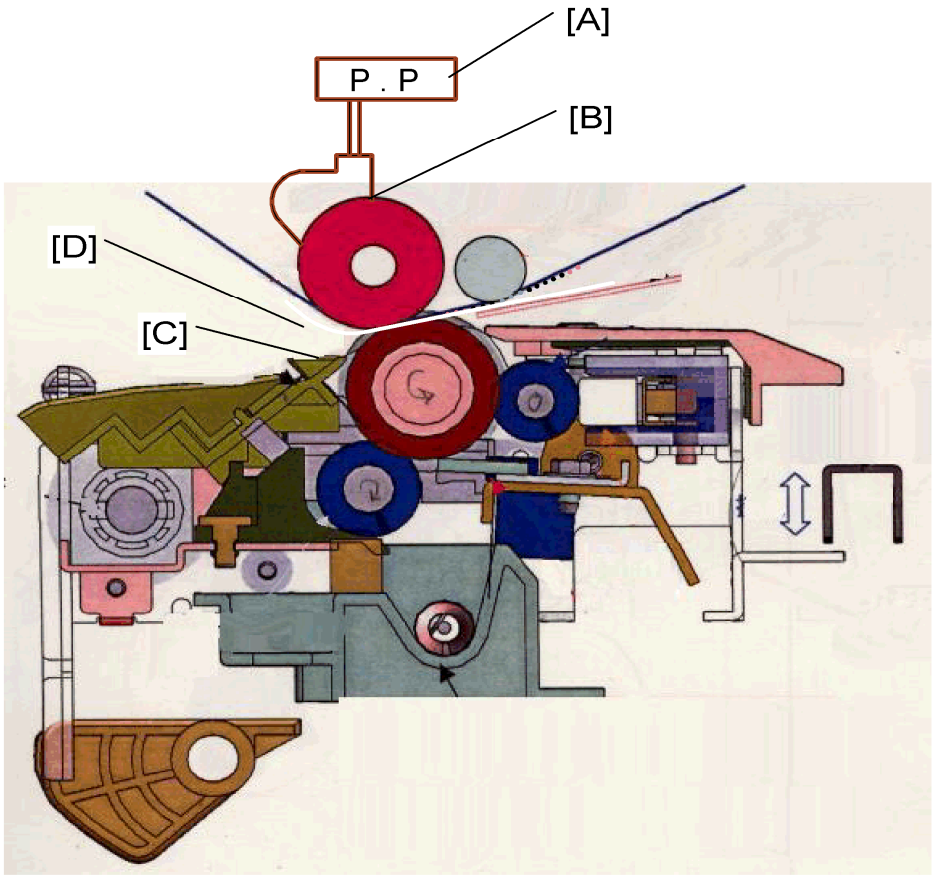


temp_ptu1

1. ITB (Image Transfer Belt)
2. ITB Bias Roller
3. PTR (Paper Transfer Roller)
4. Tension Roller
5. Entrance Guide
6. Lubrication Brush Roller
7. Lubrication Bar
8. Lift Bracket
9. Cleaning Blade
10. Toner Collection Coil
11. Paper Dust Brush
12. Paper Discharge Plate

Note: Items 6, 7, 9, 10, 11 comprise the PTR cleaning unit.

Image Transfer and Separation



temp_ptu1b

This machine employs a repulsion-force bias system for belt-to-paper image transfer.

The transfer power pack [A] applies a negative bias to the ITB bias roller [B].

The negative bias applied to the back side of the ITB forces the toner from the surface of the belt onto the paper.

This system has two advantages:

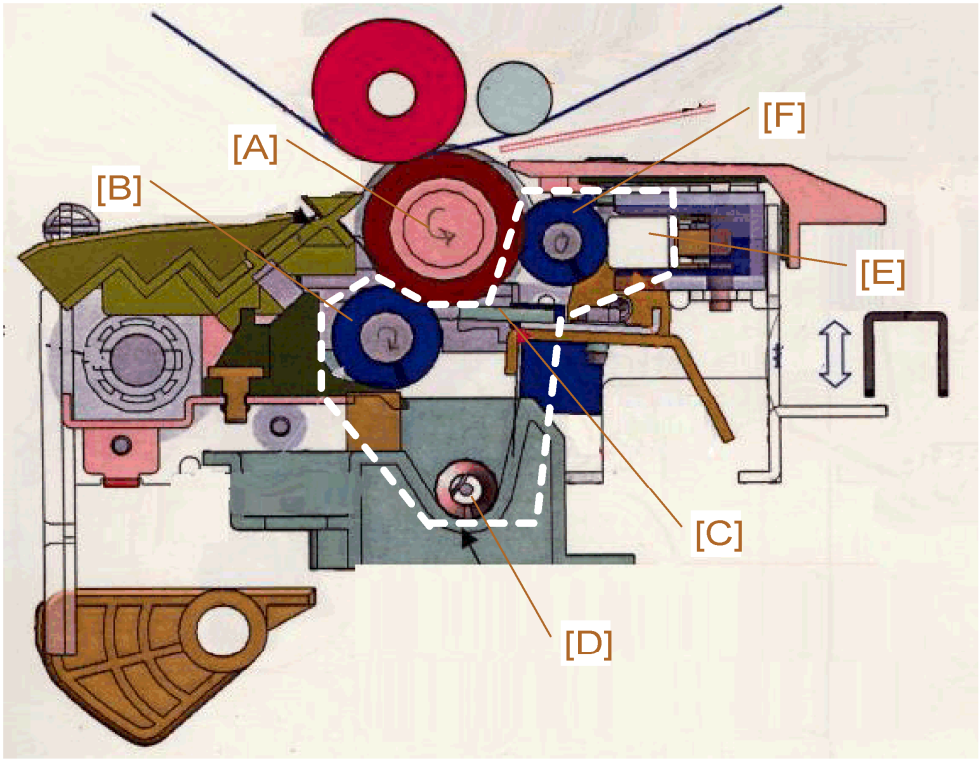
- The negative bias has no effect on the moisture in the paper.
- Because the bias is applied from the front side of the paper, the bias can be applied more effectively, regardless of the level of humidity around the paper.

After the image has been transferred to the paper:

- The paper discharge plate [C] (connected to the separation power pack) applies an ac charge to neutralize the charges on the paper and the ITB.
- Next, curvature separation at [D] separates the paper from the belt when the ITB makes

its abrupt turn toward the top of the machine for the next copy cycle.

PTR Cleaning



temp_ptu1a

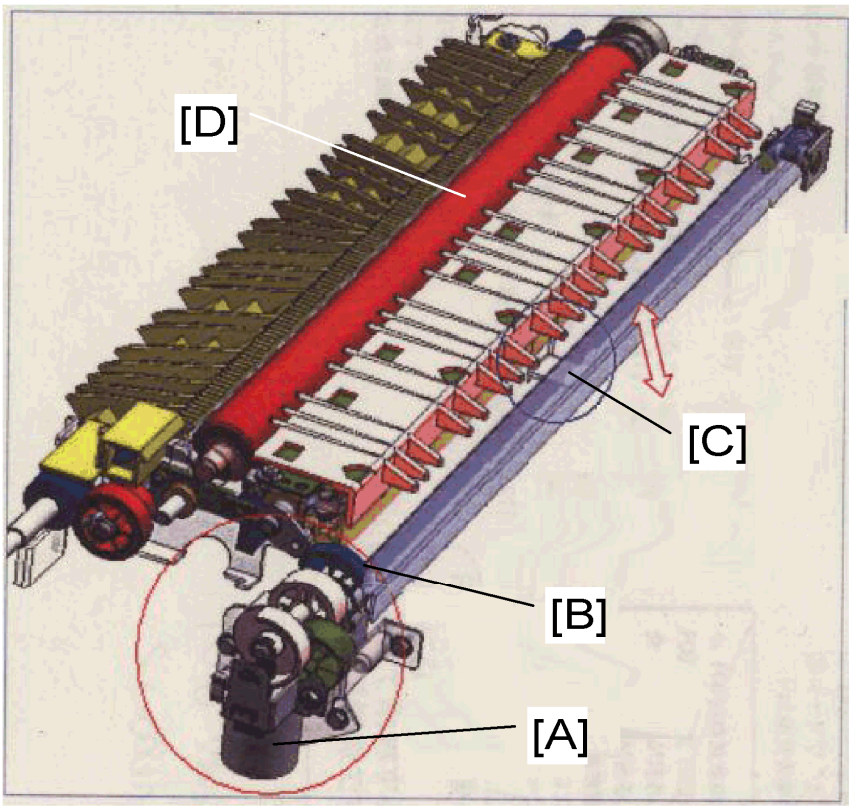
[A]	PTR
[B]	PTR brush cleaning roller
[C]	PTR cleaning blade
[D]	PTR toner collection coil
[E]	Lubricant bar (ZnSt)
[F]	PTR lubricant brush roller

The PTR [A] turns counter-clockwise.
The brush cleaning roller [B] (driven by the PTR motor), removes toner from the PTR. The PTR cleaning blade [C] removes any toner remaining on the surface of the PTR after brush cleaning. Toner removed by the brush cleaning roller and cleaning blade falls into the PTR toner collection coil [D]. This rotating coil moves the toner to the transverse used toner collection coil at the back of the machine where it is sent to the used toner bottle.
The PTR lubrication bar [E] lubricates the PTR lubricated brush roller [F]. This lubricated roller lubricates the surface of the PTR to prevent scratching or scouring of the roller surface.

PTR Lift

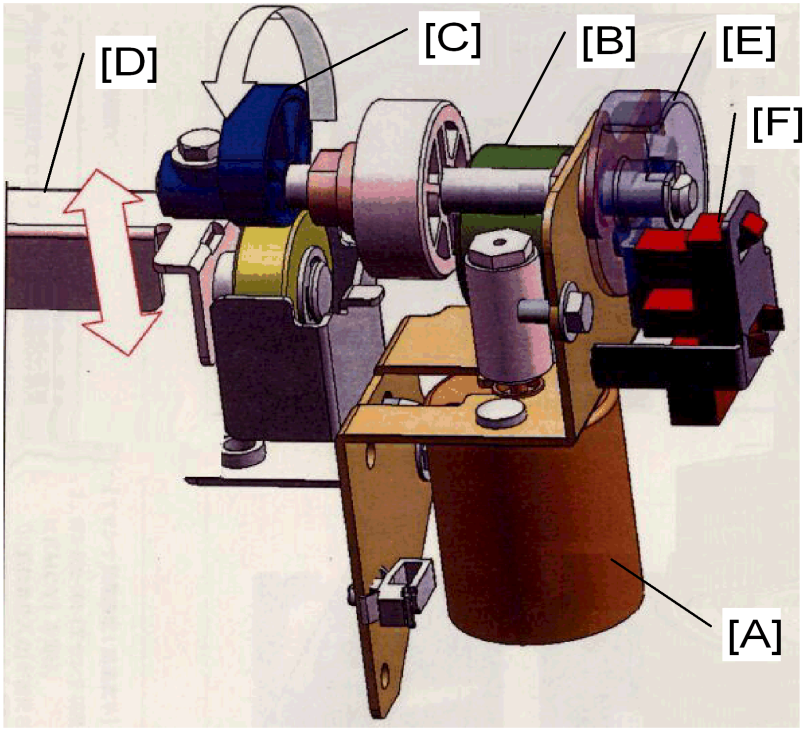
The PTR lift mechanism raises and lowers the PTR unit.

- The lift mechanism raises the PTR against the ITB for belt-to-paper image transfer.
- The lift mechanism lowers the PTR and pulls it away from the ITB when the machine is not printing.



temp_ptu2

The PTR lift motor [A] rotates cam [B]. The rotation of the cam raises and lowers the lift plate [C] which in turn raises and lowers the PTR [D].



temp_ptu3

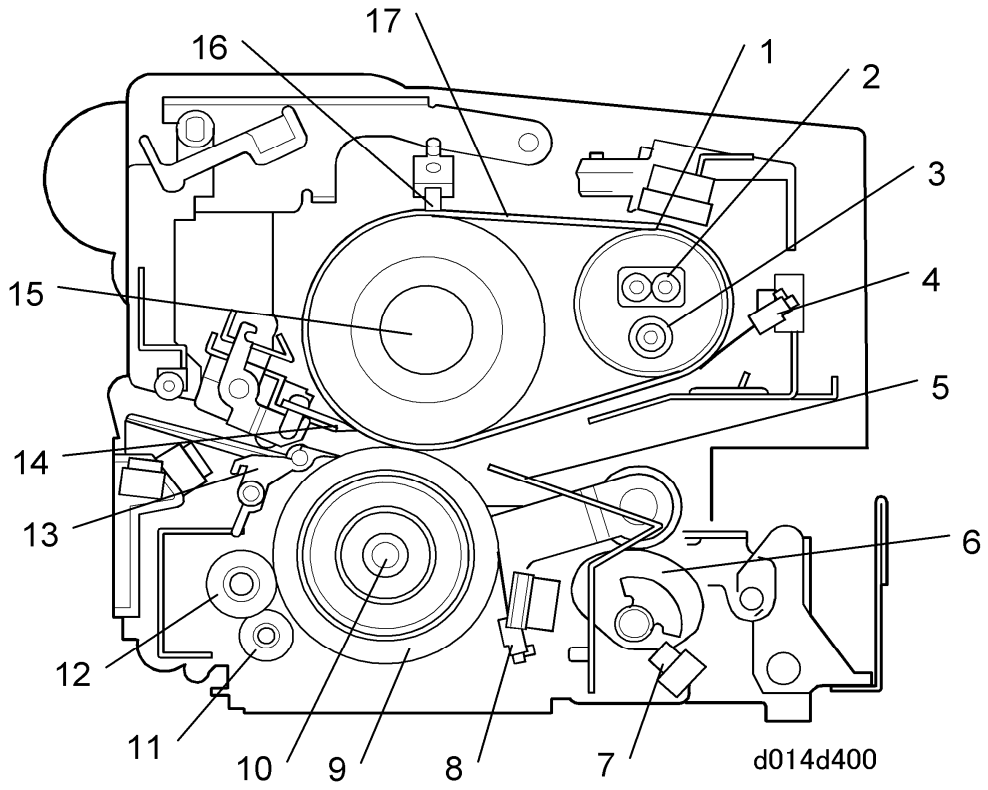
The PTR lift motor [A] operates the drive train [B] that rotates the cam [C]. The rotation of the cam raises and lowers the lift plate [D].

A circular actuator [E] attached to the shaft of the cam shaft passes through the gap in the PTR lift sensor [F]. The interaction of this actuator and sensor tells the machine when to stop raising and lowering the PTR.

Fusing Unit

Overview

Fusing Unit Components



1.	Heating Roller	10.	Pressure Roller Fusing Lamp
2.	Heating Roller Fusing Lamps x2	11.	Cleaning Roller
3.	Heating Roller Fusing Lamp x1	12.	Oil Supply Roller
4.	Heating Roller Thermistor	13.	Pressure Roller Strippers
5.	Entrance Guide	14.	Fusing Belt Strippers
6.	Pressure Roller Lift Mechanism	15.	Hot Roller
7.	Pressure Roller Lift Sensor	16.	Fusing Belt Thermistor
8.	Pressure Roller Thermistor	17.	Fusing Belt
9.	Pressure Roller		

A fusing belt and three rollers comprise the fusing unit. The rollers are:

- Heating roller (fusing lamps x3)
- Pressure roller (fusing lamp x1)
- Hot roller (no fusing lamps).

The hot roller is composed of a new, softer sponge material that applies more even pressure during fusing. Because the hot roller is very soft, a mechanism is provided to retract the pressure roller from the hot roller and fusing belt when the machine is not operating.

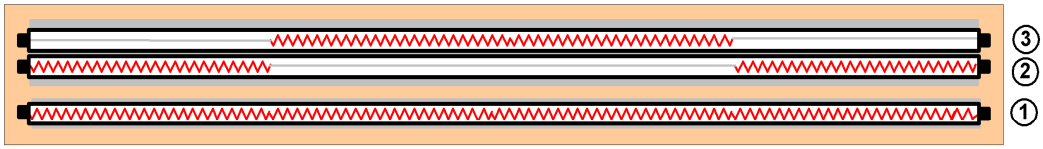
Fusing Unit Specifications

Fusing Method	Fusing Belt System	
Fusing Lamps	Heating Roller (3 halogen fusing lamps)	
	Pressure Roller (1 halogen fusing lamp)	
Roller Diameters	Heating Roller: 35 mm Hot Roller: 52 mm Pressure Roller: 50 mm	
Roller Thickness	Heating Roller: 0.6 mm Hot Roller: 10 mm Pressure Roller: 1.5 mm	
Heat Detection	Thermostats x3	Heating Roller Center x1 Heating Roller End x1 Pressure Roller x1
	Thermistors x5	Heating Roller x3 Pressure Roller x1 Hot Roller x1
Fusing Unit Drive	Fusing/Exit Motor (Paper Transport) Pressure Roller Lift Motor (Raises/lowers pressure roller)	

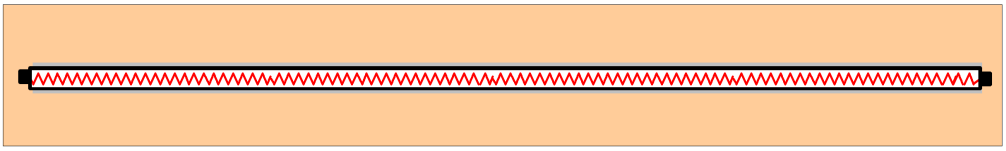
Warm-up Time	EU/AP	Less than 75 s		< 300 s
	NA	D014	Less than 90 s	
	D015	Less than 75 s		
First Copy	FC	D014	7.5 s	7.5 s
	D015	6.4 s		
	B&W	D014	5.7 s	6.5 s
	D015	4.9 s		

Fusing Lamp Ratings

Heating Roller



Pressure Roller



Hot Roller

temp_fusingvc2

	NA	EU	
Heating Roller	①	117V 250W	227V 400W
	②	117V 700W	227V 700W
	③	117V 700W	227V 700W
Pressure Roller		117V 400W	227V 600W

The fusing belt system applies heat to the belt at two points: the heating roller and the pressure roller. This conserves space and allows these rollers to be smaller (less pressure is required for fusing so less torque is required).

- The fusing belt applies heat directly to fuse the toner to the paper.
- The heating roller has three fusing lamps. It applies heat to the fusing belt after the fusing belt passes the hot roller. The heating roller also keeps the fusing belt hot while the machine is in standby mode.
- The pressure roller has a metal core to provide rigidity, and is covered with Teflon to prevent toner from adhering to its surface. It applies heat with one fusing lamp to maintain the temperature of the fusing belt while the machine is in standby mode.
- The fusing exit sensor detects jams at the fusing exit by confirming that paper arrives at the fusing exit at the correct time.
- The hot roller is a sponge roller designed for a higher line speed and better grip at the nip. A pressure roller lift mechanism keeps the pressure roller separated from the hot roller while the machine is idle, to protect the hot roller from warping.

The fusing/exit motor speed depends on the type of paper selected for the job. Refer to the table below.

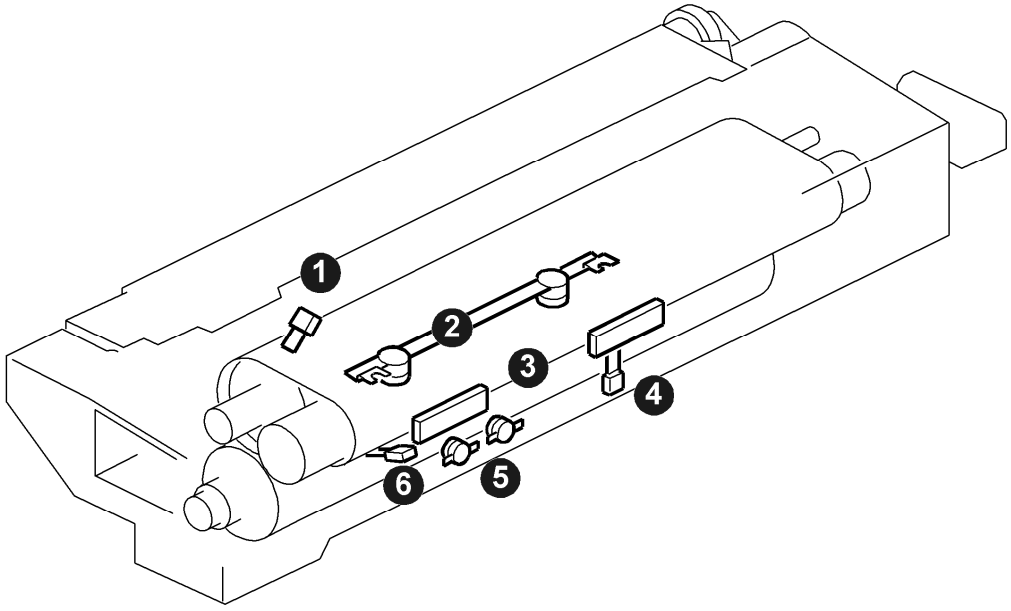
D014

Paper Thickness Mode	Paper Wgt (g/m2)	Speed (mm/s)
Normal	52.3 to 65 (including 58 W)	282
Normal 1	66 to 100	282
Normal 2	81 to 100	282
Medium	101 to 127	282
Thick 1	128 to 163	176.4
Thick 2	164 to 249	176.4
Thick 3/OHP	250 to 300	141

D015

Paper Thickness Mode	Paper Wgt (g/m2)	Speed (mm/s)
Normal	52.3 to 65 (including 58 W)	352.8
Normal 1	66 to 100	352.8
Normal 2	81 to 100	352.8
Medium	101 to 127	282
Thick 1	128 to 163	176.4
Thick 2	164 to 249	176.4
Thick 3/OHP	250 to 300	141

Thermistors, Thermostats



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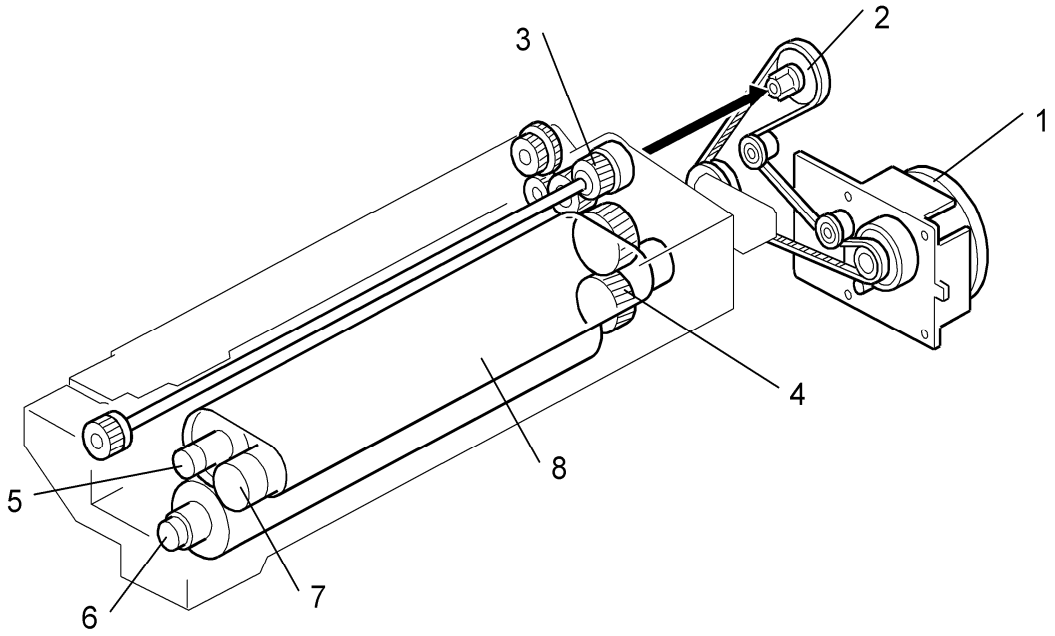
5. Hot Roller Thermistor
6. Heating Roller Thermostats
7. Heating Roller Thermistors
8. Pressure Roller Thermistor
9. Pressure Roller Thermostats
10. Heating Roller Thermistors

The heating roller has one thermistor and two thermostats. An additional two thermistors (non-contact) are provided at the center and ends of the heating roller.

- Thermistors take heat readings that the machine uses for fusing temperature control.
- Thermostats are trip devices with hysterisis elements that will trip if a component overheats in their vicinity. When the thermostat trips, this shuts down the fusing unit.

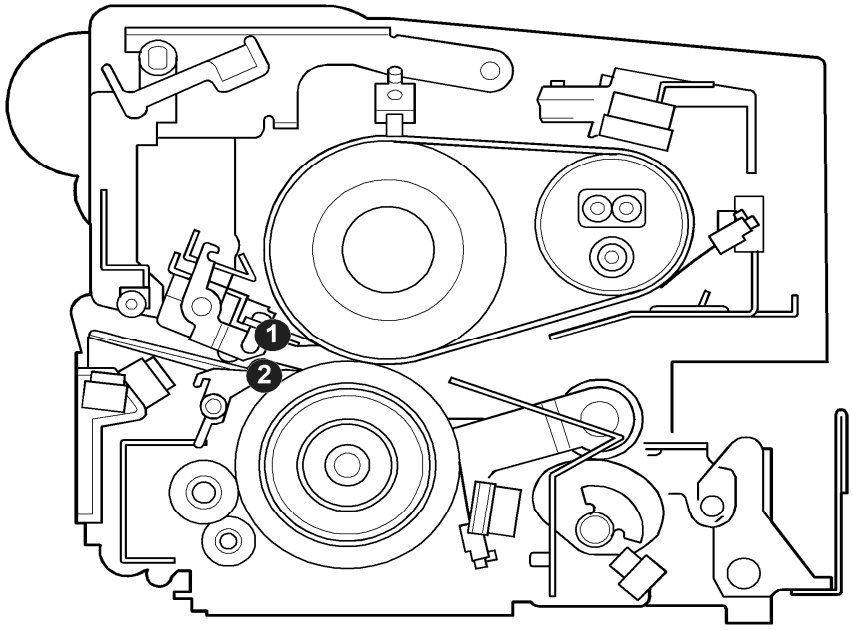
Fusing Unit Drive



11. Fusing/exit motor
12. Coupling, Timing Belt
13. Drive Roller
14. Idle Rollers
15. Hot Roller
16. Pressure Roller
17. Heating Roller
18. Fusing Belt

The fusing/exit motor [1] drives the coupling [2] and main drive shaft [3] via a timing belt. The idle rollers [4] rotated by the main drive shaft, turn the hot roller [5], pressure roller [6], and heating roller [7]. These rollers drive the fusing belt [8] tightly wrapped around these rollers.

Strippers



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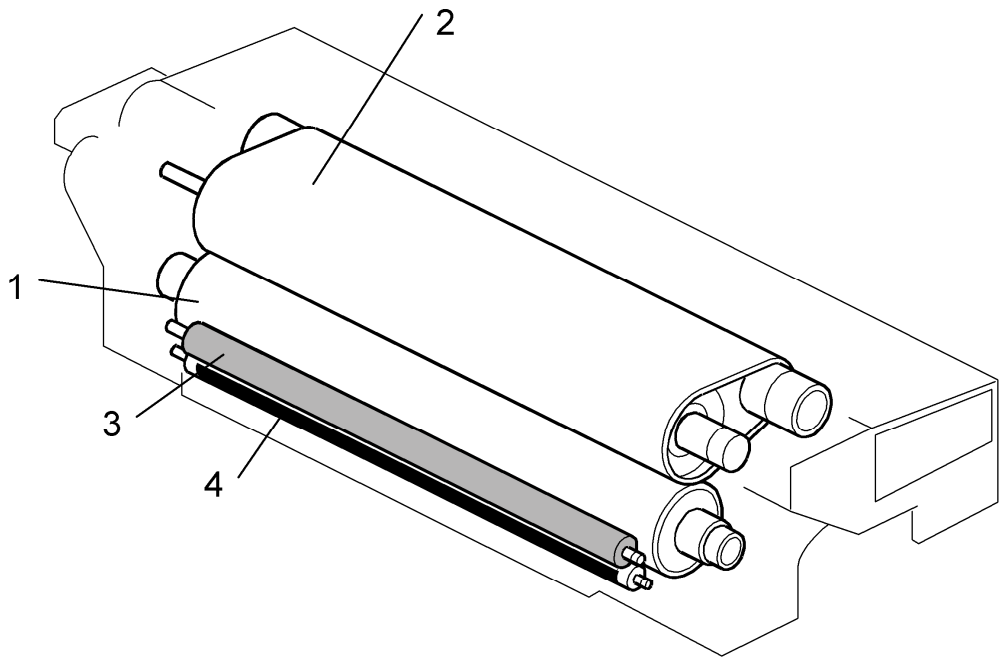
Stripper plates ① touching the fusing belt remove any paper that may accidentally stick to the belt after fusing. These are smooth plates, not sharp pointed pawls.
Unlike the fusing belt stripper plate mechanism, the pressure roller strippers ② are sharply pointed. They touch the fusing belt above the pressure roller to remove any paper that may accidentally stick to the belt after fusing.

Fusing Belt Lubrication and Cleaning



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19. Pressure Roller
20. Fusing Belt
21. Oil Supply Roller
22. Oil Supply Roller Cleaning Roller

The pressure roller [1] pushes up against the fusing belt [2] and hot roller.

The oil supply roller [3] applies lubricant to the pressure roller.

The oil supply roller cleaning roller [4] cleans the oil supply roller.

Fusing Temperature Control

Basic Temperature Control

The fusing unit has four fusing lamps:

- Three in the heating roller
- One in the pressure roller
- The heating roller with its three lamps is the main source of heat for fusing.
- The hot roller has no fusing lamp so it applies no heat.
- The pressure roller maintains the temperature of the fusing belt while the machine is in standby mode.

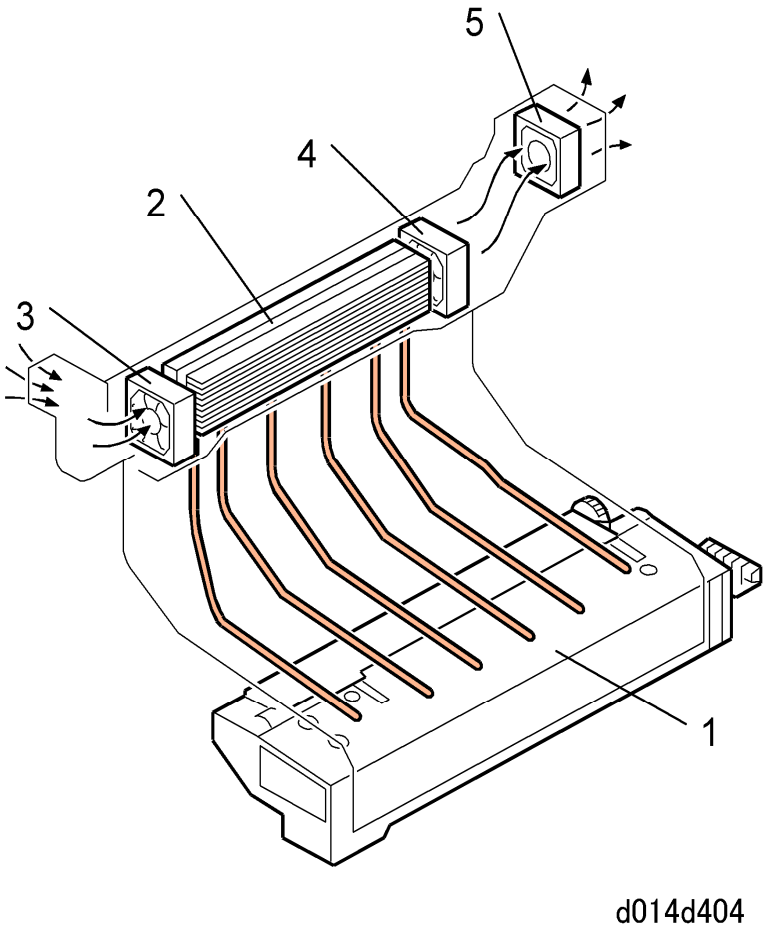
Feedback from the thermistors assigned to each roller is used by the machine CPU to control fusing temperature.

Temperature Adjustments

The temperature inside the machine is measured with the temperature sensor located near the used toner bottle. These temperature readings are used to make adjustments based on the internal temperature of the machine:

- If the temperature inside the machine is less than 20°C, all target fusing temperatures are increased by 5°C.
- If the temperature inside the machine is more than 20°C, the standby temperature is decreased by 5°C.

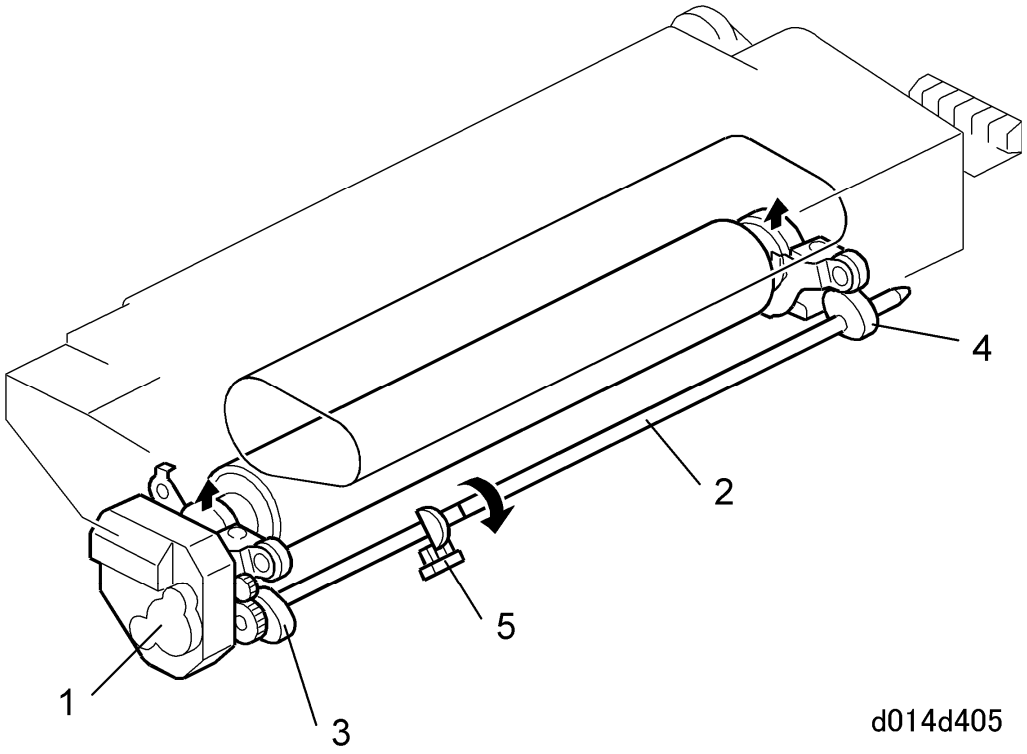
Fusing Unit Ventilation



23. Fusing Unit
24. Heat Sink
25. Intake Fan
26. Exhaust Fan 1
27. Exhaust Fan 2

Heat from the fusing unit [1] is drawn off by the pipes and collects in the heat sink [2]. The fusing unit intake fan [3] draws in cool air and blows it through the laminations of the heat sink. The first exhaust fan [4] draws the heated air out of the heat sink. The second exhaust fan [5] takes the hot air and blows it out of the machine.

Pressure Roller Lift Mechanism



A pressure roller lift mechanism raises the pressure roller against the hot roller and fusing unit above and then lowers at the end of the job.

- When a job starts, the pressure roller lift motor [1] switches on rotates the cam shaft [2].
- The cams [3] and [4] raise the pressure roller against the hot roller and fusing belt.
- The motor (a stepper motor) stops when the actuator activates the pressure roller lift sensor [5] and the pressure roller remains up.
- At the end of the job, the motor reverses and lowers the pressure roller away from the hot roller.

The hot roller and pressure roller remain separated while the machine is idle. This prevents the pressure roller and hot roller from warping and thus prolongs their service lives.